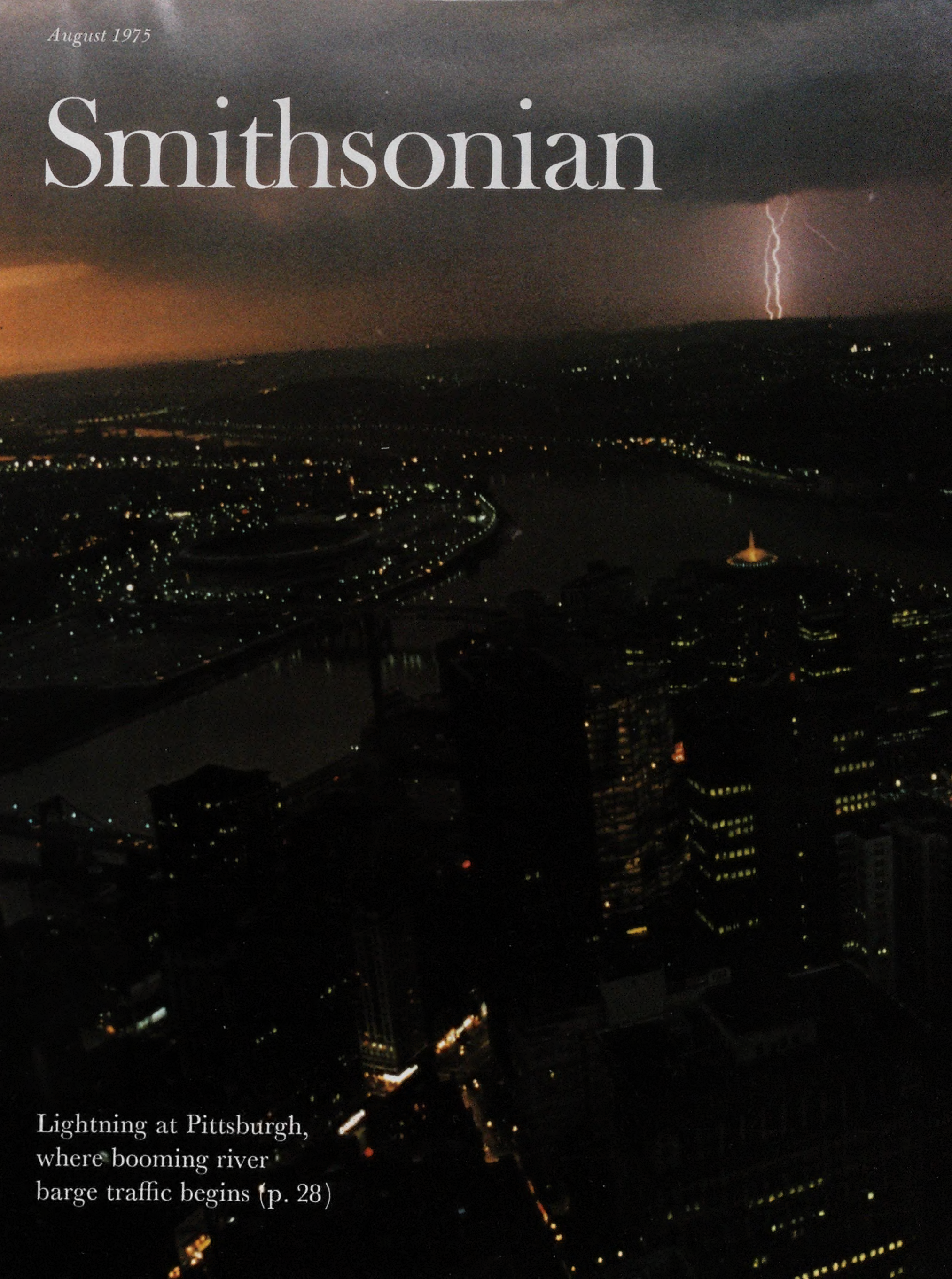
August 1975

Smithsonian



Lightning at Pittsburgh,
where booming river
barge traffic begins (p. 28)

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Catalytic converter, standard equipment on 1975 model GM cars.

After more than a billion miles on the road, GM's catalytic converter has become a world standard in fuel-saving pollution control devices. Auto-makers in Europe, Asia and North America have contracted to buy converters from GM.

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The converter is the kind of startlingly effective advance in automobile engineering that challenges other technology. It demands lead-free, low sulfur fuel. It leaves behind a lot of other pollution control concepts that don't have its qualities of durability and its fuel-saving characteristics. So the converter has come in for a bit of what we call "wishful criticism."

The fuel-saving, ecologically sound catalytic converter. Standard equipment on 1975 cars from General Motors, a world leader in automotive pollution control technology.

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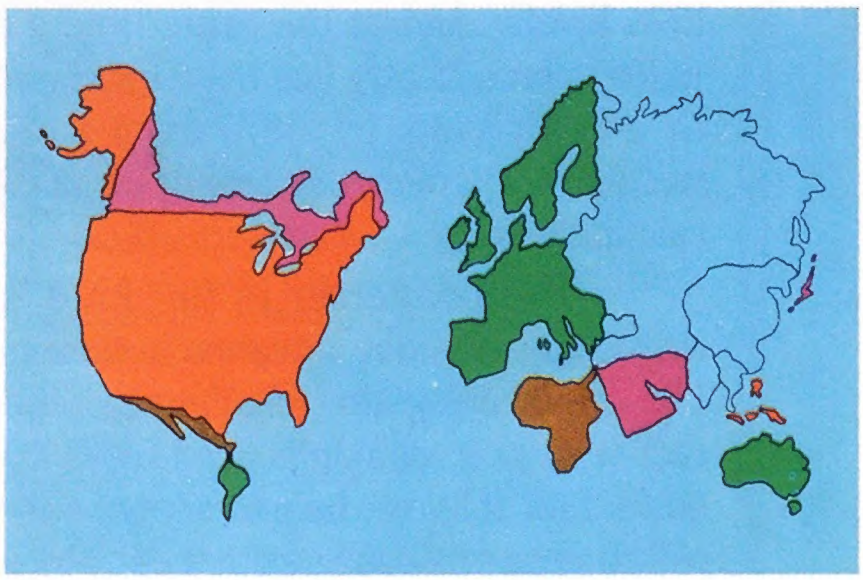
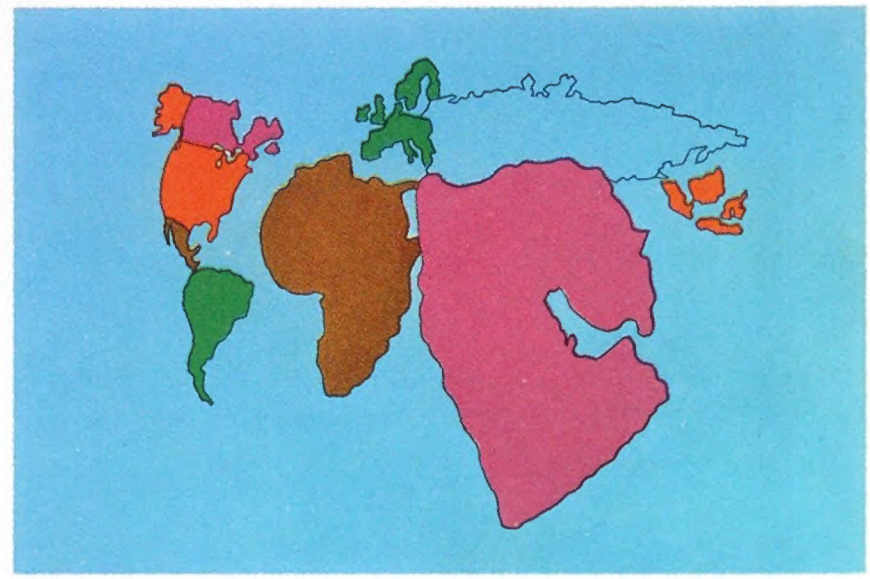
America's coal: a gold

The U.S. has more energy in coal than in oil and gas combined. Here's what Exxon is doing to help put coal's energy to work today.



The world of coal. The map above shows what the world would look like if the size of each country were in proportion to the coal reserves under its land. America—with nearly half the free world's coal—dwarfs Europe and the Middle East. Experts estimate that at the rate the United States uses coal today, these reserves could help keep us in energy for the next two hundred years. This could help supplement dwindling supplies of U.S. gas and oil—and more importantly, provide our country with an energy source that's right here at home.

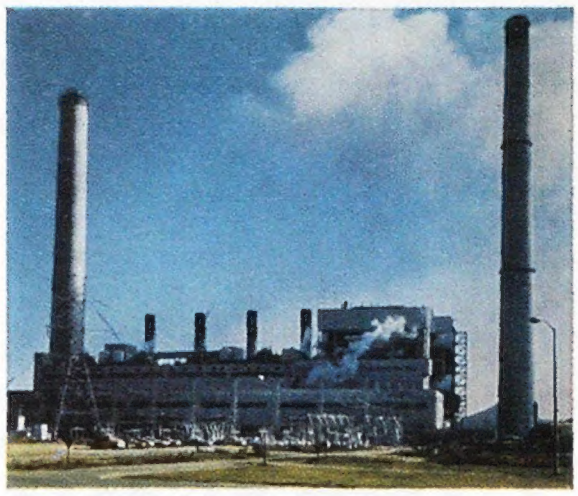


The world of oil. This map shows where the world's oil is located. Most of it is in the Middle East. By comparison, however, the energy in U.S. coal is twice the amount of energy in Middle East oil. Exxon anticipated the growing demand for coal several years ago. That's why Exxon is continuing its program aimed at helping America take greater advantage of this vast energy resource. Exxon scientists and engineers are working to find better ways to mine coal, cleaner ways to burn it, and new ways to put coal to work.

An example of land reclamation. Exxon is firmly committed to reclaiming land which may be disturbed by our mining. We have no operational coal mines in the West right now. But, our uranium mine near Casper, Wyoming, is an excellent example of how our reclamation program works. Since operations began, Exxon has been continually contouring, planting and reseeding the disturbed areas with yellow clover, crested and western wheat grasses. Right now, it's difficult to tell the natural landscape from the reseeded landscape. When we've finished mining here, the land will be at least as productive as it was before we came.

mine of energy.

A new kind of coal town. To most visitors, the Court House at Carlinville, Illinois, typifies the picturesque beauty of this Midwest community. In 1970, Exxon opened a new mine near Carlinville. Today, the town is still as clean and picturesque as ever. And a lot more prosperous. Employment is up 22 percent, with over 300 new and high-paying jobs, Recently, leaders from other prospective coal towns visited Carlinville to see how coal mining and a good city can thrive side by side.



America's biggest coal users. Most coal used in America today is burned by electric power plants like the one above. These plants consumed about 400 million tons of coal last year. By 1985, this figure could jump to nearly 700 million tons. This surge in coal consumption will go a long way toward freeing gas and oil for other purposes. And it will also mean thousands of new jobs for people here in the United States.

New mines, new miners, new methods. Putting a modern coal mine into production calls for a lot more than a pick and shovel. Many years must be spent in planning and development. New mining techniques must be tested. New mining talent must be trained. New transportation systems must be set up. All so that when a new Exxon mine opens it will produce coal in the most efficient and environmentally responsible way.

Cleaner energy from coal. Exxon is deeply involved in pollution control research. The TIGER van—or Traveling Industrial Gaseous Emission Research vehicle—is an important part of a program Exxon is conducting for a U.S. government agency. The TIGER van's job is to monitor and record emissions from coal-fired boilers and power plant stacks. The data collected is used by Exxon engineers to test new coal combustion techniques which may help bring America more energy without more pollution.

EXXON

Secretary Ripley's comments

The view from the castle

The rhetoric by true believers in science and nonbelievers has again obscured the issue of what is good for the nation

We live in an awkward time, a time of what is known as *rhetoric,* a time of *adversary positions.* One of the sadnesses of this time is the difficulty of believing or disbelieving whatever one reads in the newspapers. A small sample of this is the current spring and summer madness, rather like streaking, which has possessed the advocates of big science on the one hand and, on the other, the philistines who do not believe science is here to stay.

As the proprietor of great museums of history, of science and of technology, the Smithsonian not only knows that science and technology are here to stay, but that there is no turning back from them. Thus, this winter's debate (if that is what it was) in committees of the Congress of the United States over the budget of the National Science Foundation became as inglorious as the debate in Avignon in the 14th century over how many angels could dance on the head of a pin.

The debate in itself was a symptom of the times, the unwillingness of some to accept the premise that the pursuit of basic science produces unexpected but long-term results for the good of the human condition, in the face of the superior conviction of many scientists that they, as keepers of the mysteries, are demeaned by oversight or jurisdictional control. Both positions are, of course, untenable, and it is unfortunate that in the resulting clash, objectivity or lack of bias got left out.

How can science be managed by some? Are science managers capable of objectivity or are they conspiring with other intellectuals to perform some bunco rip-off on the American taxpayer? Added to these elements in the adversary debate are the defenders of the American ethic, who insist that formal education, ineluctably in "science," is the panacea for our ills—our national secular religion (this has been accepted as dogma for more than 100 years, since the Land-Grant Act democraticized the idea of higher education).

Yet scientists are on the defensive, hostile toward critics who carp at their intellectual self-sufficiency or assured smugness. Of course scientists can be smug, but, heaven knows, in years past it was the public adoration of science as the great nostrum which pushed our government and foundations into the support of science training. This created a new dilemma in the overproduction of *wunderkinder* headed for careers in the natural and physical sciences. Most of those of us in America were alive when Sputnik flashed across the heavens, alerting us to the imminent danger of losing our technological superiority. Fewer of us were alive when the bombs exploded over Japan in the Forties. Some of us will be alive, God willing, in A.D. 2000 to wonder at the continued survival of the oldest Republic in the world.

If we can understand that the support of science and technology in this country is an irreversible choice, that there is no way out of employing the medical, biological and physical sciences to cope with the real world, then we must maintain and increase public understanding of what science is all about, full employment or not. But in all this, scientists must be humble and realistic in the people's service, cherish lovingly the nation's good and, as citizens and without rhetoric, weigh their own values.

S. Dillon Ripley

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A Prospect of the City of London from St Marie Overs Steeple in Southwark in its flourishing Condition before the Fire
The River Thames

Darkness at Noon

BY JOHN LETTS

'A most horrible, malicious, bloody flame, not like the fine flame of an ordinary fire' observed Samuel Pepys in his diary. In four days and four nights the Great Fire consumed by far the greater part of what was then considered the centre of the civilised world. In later centuries, it is a story too much taken for granted: the enormous scale of the devastation is forgotten. Over *thirteen thousand* houses consumed: *eighty-seven* churches: *forty-four* of the rich livery companies' halls (only seven survived): some *eighty per cent* of the city within the Roman walls devastated as thoroughly as Hiroshima, if not quite so instantaneously. The horrible, malicious flame was visible 'above forty miles roundabout for many nights': the smoke 'so great that it darkened the sun at noonday'.

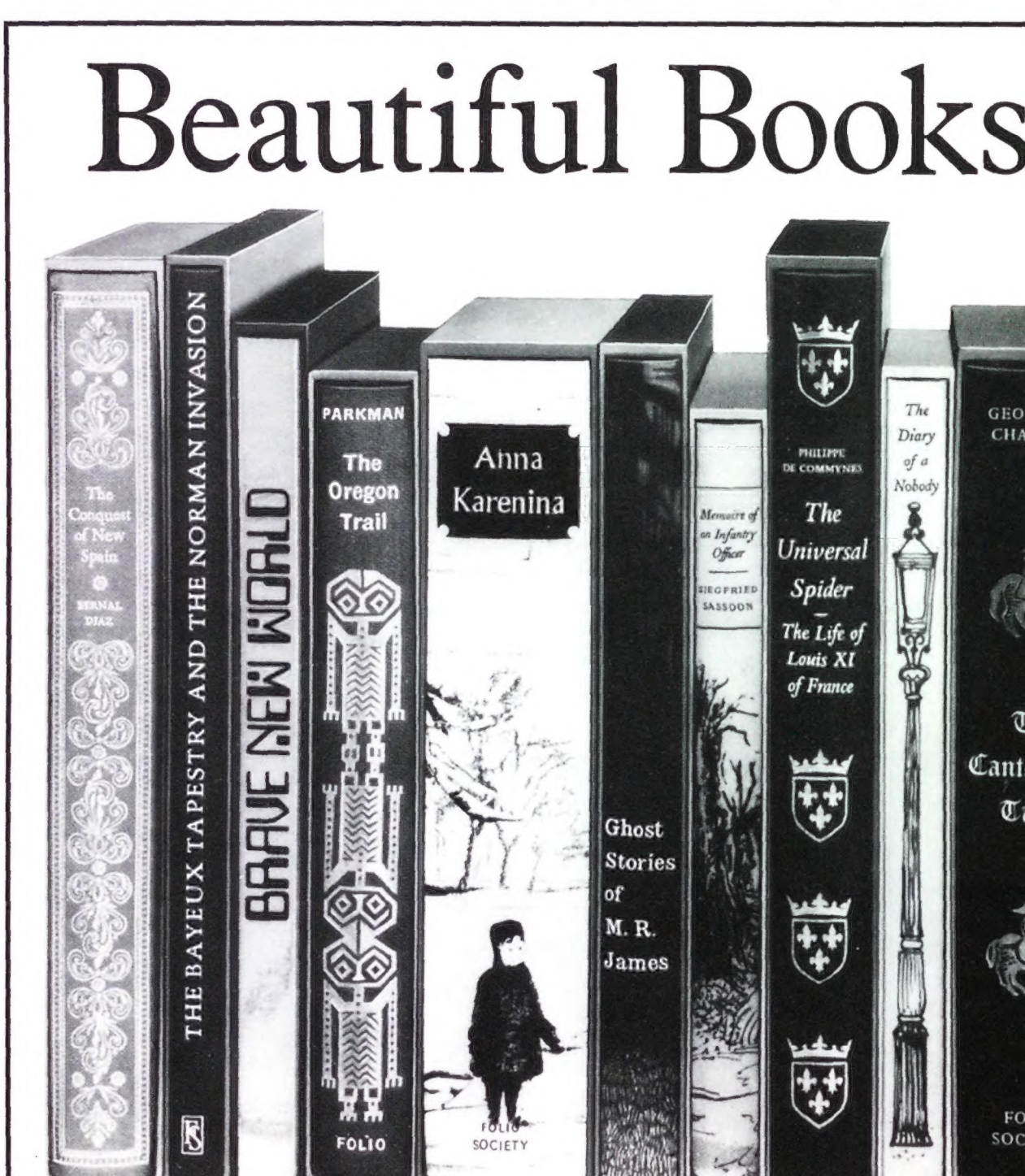
Yet the City rose again. The story of that resurrection is quite as compelling as the story of the holocaust itself, and its achievement remembered all over the world. (After the terrible Tokyo earthquake of 1923, the Japanese sent to know how London had dealt with her calamity two hundred and fifty-seven years before.) The inscription on The Monument claimed, quite untruthfully, 'Three short years complete that which was considered the work of an age': in truth, the last plot for rebuilding was not staked until 1696, thirty and not three years later.

Eric de Maré's skilful and vivid narrative in *Wren's London* traces the ways in which the hand of a true genius, Dr Christopher Wren, shaped the rebuilding. His plan for a new, splendid city was presented to the King, incredibly, only six days after the fire had died down. Most of it was rejected. Too many conflicting interests were at stake for any single plan to rebuild 'with pomp and regularity' a city which could have become, said Wren's son, 'the Wonder of the World'.

Yet, if London missed its finest opportunity for improvement (a debatable point), Wren's genius certainly added an astonishing grace to a City which had never previously been renowned for beauty. For three decades, he dominated the rebuilding. He helped frame the two rebuilding acts, rebuilt the Guildhall, carried through a major improvement of London's waterside, gave London two or three outstanding secular buildings such as The Custom House and Temple Bar, and to crown all, perhaps the finest series of cathedrals and churches to have come from a single hand anywhere in the world, including London's most famous visual symbol, the great cathedral of St Paul's.

Many feel it was a tragedy that his favourite design—The Great Design—was rejected: yet its successor, the cathedral we have today, was a masterpiece, too, by any standards. His reward for half a century of patient and devoted labour was dismissal from his post of Surveyor-General for mismanagement, at an age when he might have been allowed some

One of Elisabeth Frink's suite of three-colour lithographs for the Folio edition of The Odyssey.



reward 'having worn out by God's mercy a long life in the royal service', as he said with his usual dignity. His monument, as his tomb in St Paul's correctly says, lives forever around this last resting place of one of the greatest and most generous of Englishmen.

It is a strangely awe-inspiring and uplifting story.

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From headquarters in London, England, a few yards from the site of Shakespeare's Globe Theatre, it services your orders as promptly as it could if it was transported to Manhattan. Its name—internationally famous for book design for over 28 years—is The Folio Society. Probably many more discriminating readers in the United States will know its reputation than will have actually seen its books—especially if they should have fallen prey to any of the following understandable (but fallacious) misunderstandings...

The Folio Society simply reprints classics. Not so. A large part of the list is previously unpublished or un-translated.

The Folio Society makes high priced luxury editions. Far from it. The average cost of all the books in the current list is still only just over $11, *post free.*

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Phenomena, comment and notes

Women and annals of TV crime, space-age violins, homely bricks and the intervention of bird watchers

Nobody is more loving of birds than devoted bird watchers, yet it is possible they are doing damage, in evolutionary terms, to the objects of their affection. Specifically, veteran bird watchers often amble around the woods stage-whispering something like "Spsh, spsh" (which isn't all that easy to say) in order to attract warblers and other passerines. It works, and the reason why has been detailed by Neal G. Smith of the Smithsonian's Tropical Research Institute (see pp. 52-63).

"Spsh," it turns out, mimics the vocalizations of certain tropical birds with which North American birds get together at the end of their migration. The migrants, according to Dr. Smith, have learned to hang around the tropical natives so that they can take advantage of local intelligence as to food sources. (This is not true of European and African counterparts, since there is more food available in Africa and the outlanders do not need help.)

But the question arises: If too many temperate-zone bird watchers run around spshing, won't the warblers wise up, learning that that signal leads only to a pair of binoculars, not breakfast, and give up the whole thing, leading to problems for themselves in the tropics and less satisfaction for the bird watchers?

"Spsh" leads to binoculars, not food.

Violence and the tube

The point is much debated as to whether watching violence on television renders the watcher violent. No doubt the question will continue to be debated as long as cartoon characters bop each other and two-dimensional cops take on TV's two-dimensional criminals. But there is now evidence that television does distort the viewer's notion of the real world.

According to researchers at the University of Pennsylvania's Annenberg School of Communications, there were fewer killers and other violent characters on the tube in 1973-74, but the rate of victimization was up. That is, for every violent character, there were more victims. There is also what seems an inappropriate sexual bias. Over the past seven years, there have been 21 male killers for every 10 men killed, and 10 women killers for every 15 women killed. That means that TV women get it more often than men.

The result of all this, according to *Society* magazine, is that hard-core tube watchers have a thoroughly distorted notion about how dangerous society is. It appears that younger people, especially—and in particular young women—think that life in these United States is a lot more dangerous than it really is. Presumably such a "cultivated differential" could have fairly profound effects on the politics of law and order.

Women as crooks

In fact, in the overall array of crime on television, there may have to be an upward adjustment in the number of women

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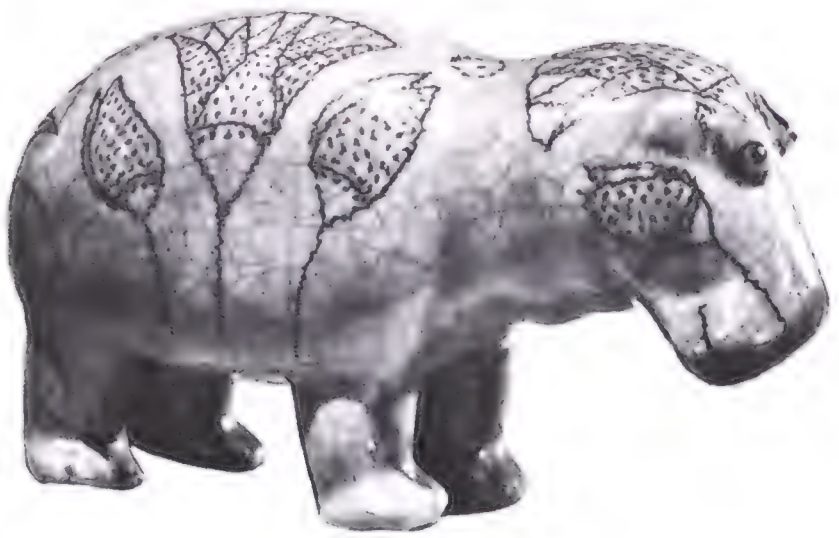

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criminals if the fairness doctrine of the liberation movement is to be applied. *Science News,* reporting on the findings of Rita James Simon of the University of Illinois, says that the role of women in crime is changing.

No more downtrodden female felons dutifully attracting victims, watching out for the fuzz or driving the getaway car while the chauvinist male thugs do all the exciting work. Women seem to want a piece of the action even in this endeavor, and the statistics prove it. In the last two decades, the percentage of arrests of females in serious crimes—except homicide—rose from almost 10 percent to almost 20. Similar increases are reported in embezzlement and fraud, and forgery and counterfeiting. Indeed, female white-collar crime can be expected to increase right along with the rate at which women don white collars.

Homicide is not expected to increase, says Ms. Simon, since female killers frequently kill out of frustration over their own subserviency and dependency and, apparently, it is thought there is less of this once one's educational and professional opportunities increase.

Here is a case where liberation leads to greater incarceration. Penologists had better be ready for demands for coed dorms in the slammer.

Danger on the farm

Cauliflower is dangerous; not so much to eat, you understand, as to grow.

A study of time lost by farm workers in California to occupational illness reveals an increasing problem due to exposure to pesticides. Part of the problem, according to biophysicist Joel Schwartz of the University of California at Berkeley, is that because of "environmental and other considerations, many of the less toxic but ecologically damaging chlorinated hydrocarbons (DDT and others) are being replaced by the generally more acutely toxic organophosphate pesticides such as parathion." Writing in *Environment* magazine, Dr. Schwartz notes that farm workers are often permitted to reenter fields too soon after they (the fields, but sometimes the workers) are sprayed. Also, for many crops and many pesticides, there is no reentry interval established by law. And even if such intervals are established, it is pretty difficult to enforce them: A large number of farm laborers

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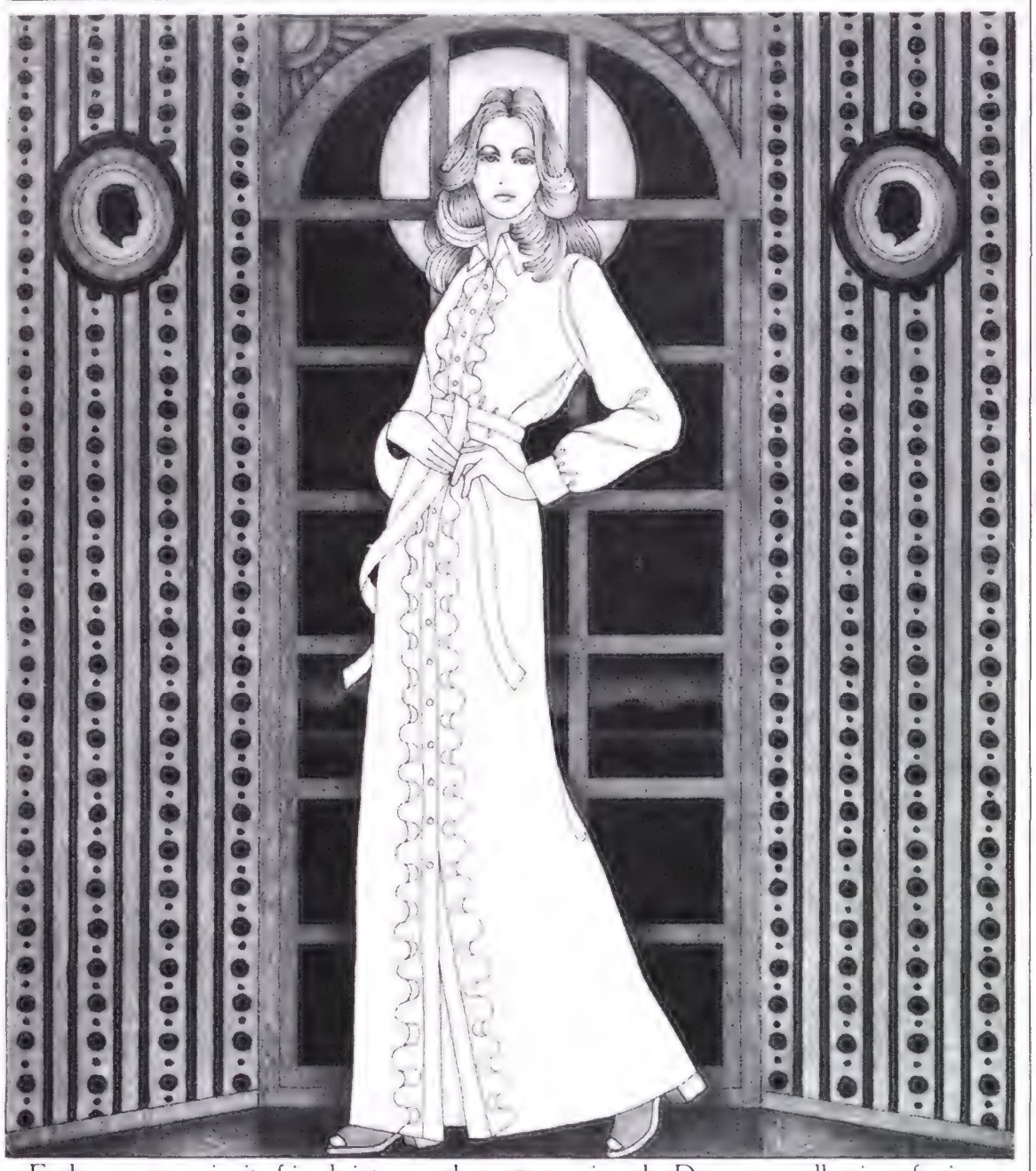

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are not in a position where they can complain with safety.

All in all, Dr. Schwartz estimates that the number of hours lost to pesticide-related illness per 1,000 hours worked may be higher than 5.25, making farm work riskier than even the construction business, which has generally been considered the most dangerous. The most dangerous crop, it seems, is cauliflower, followed by peaches and then lettuce.

Stand up to weeds

Some relief is on the way for California's horny-handed sons of toil. After hearings in which laborers, doctors and growers debated about productivity and backaches, the California Division of Industrial Safety has banished from further use the short-handled hoe.

Moo-Bricks?

In yet another development from the Golden State, a materials scientist from UCLA, Dr. John D. Mackenzie, and some colleagues have invented a process which, in the style of the alchemist, turns a common waste product into a potentially valuable natural resource.

Dr. Mackenzie finds that if you pyrolyze cow dung at high temperatures, the result is a dark oil something like crude oil; a liquid containing ammonia and nitrogen that may work as fertilizer; and an odorless dry black powder. It is the powder that interests Dr. Mackenzie most at this time. He carries calling cards printed with ink made from it; he sees it as a carbon black substitute in such processes as making automobile tires, and as a building material. Mixed up with broken glass or various other waste products and heated in an oven, it makes strong, lightweight bricks.

With an eye to consumer acceptance of houses with such origins, the scientist is seeking an appropriate name. According to *New Scientist*, suggested names include Dunglass, Shrick, Kau-Haus and Moo-Brick, but Dr. Mackenzie "is still open to suggestions."

Fiddling around with carbon

Elsewhere on the materials front, high-quality spruce (which is scarce) may be replaced as the material of choice for

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making violins. Scientists at the University of South Carolina have created a new substance called a graphite-epoxy composite, originally for saving weight in aircraft and space vehicles. But it has been found to have the same acoustical properties as fine spruce.

According to *Chemistry* magazine, the resulting black violins have been tested for quality by the Catgut Acoustical Society, Inc. And if the violin market seems a bit restricted for such a material, it looks as if it may find more use in racing-car parts and high-speed looms, as well as airplanes.

A curmudgeon's complaint

Most airlines now segregate smokers from nonsmokers, a perfectly reasonable practice which railroads, however benighted they may be, have long recognized as appropriate. But the airline regulations were based not on simple courtesy but on high moral and medical assertions. The principle, as generally understood, is that smoking is hazardous not only to your health but to that of your neighbor. Evidence is available, however (though certainly not conclusive), that healthy people do not suffer medically from other people's smoking. Unhealthy people (and there are some unhealthy nonsmokers) *are* likely to suffer from a smoke-filled room. So, for some, the matter is one of health and for others, perhaps, it is merely a matter of not being irritated.

This gets into the question of the degree to which one can insist on personal rights in a pluralistic society, a swamp of philosophical difficulties. But it may be fair to point out that if one has the right not to be irritated by smoke on an airplane, then one also has the right not to be irritated by something which accumulating evidence shows to be stressful even to the most healthy—that is, noise. Sharp piercing sudden screams, for example, cause what you might call a kind of low-grade stress which, presumably, when added to normal everyday stress, is debilitating to everyone.

On airplanes, most sharp, piercing screams and other forms of sudden human noise come from children under five. Airlines might contemplate establishing three zones: smoking, no-smoking and kindergarten.

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Letters to the Editor

Ozone

Dear Sir: Mariana Gosnell's article on ozone in your June issue was of exceptional interest to me. Although I had done some reading on the subject, I learned for the first time of the dangers to plant and animal life. I had thought of ozone only as benign and a protector against ultraviolet rays from the sun.
Joseph Leav
New York City

Dear Sir: I have not used an aerosol can since I read your article on ozone. I hope many others have reacted the same.
James Howe
Thomaston, Connecticut

Hyenas

Dear Sir: As a footnote to Cynthia Moss' description of the true relationship between hyenas and lions, you might be amused by the following verse I wrote during a tour of the African game reserves:

The bleaching bones upon the ground
Show that a lion's been around;
On zebra and gazelle he feasts,
And though he's called the King of Beasts,
He's really nothing but a slob—
Hyenas finish up his job.

This was based on what we were told by the tour guide. Cynthia Moss indicates that he (and I) had the roles reversed.
Raoul Blumberg
Bethesda, Maryland

Dear Sir: Apropos of your article on hyenas, we thought you might be interested in a recent article in our magazine *Air Line Pilot* about what happened to a Piper Cub, being used to fly supplies to famine victims in Africa. While it was temporarily out of service in Kenya, its fabric skin served as a meal for hyenas.

If hyenas chew up beer cans, maybe we should start importing them.
Stuart Nixon
Associate editor,
Air Line Pilot
Washington, D.C.

"Confederate Air Force"

Dear Sir: The "Confederate Air Force" article provided a wonderful glimpse of an underpublicized organization. Best of all was the photograph of the flight-line at Rebel Field; however, I think you have miscaptioned one plane. It is not a P-39 Airacobra, but the later, similar P-63 Kingcobra.
Harold R. Kruitbosch jr.
Stratford, Connecticut
Mr. Kruitbosch is correct. Ed.

Dear Sir: Author Joseph E. Brown quotes movie stunt flyer Frank Tallman as saying that the B-17 was a sitting duck to frontal attacks until its armament was modified, burned easily and "had enough systems troubles to give the plumbers' guild a nightmare."

Colorful language, but untrue. The B-17, until the advent of the chin turret, was perhaps a trifle vulnerable to head-on attacks. But a "sitting duck"? Some duck!

The only systems problem built into the B-17 was the confounded hand-operated engine primer pump that removed the skin from the copilot's knuckles.

There are a number of grizzled veterans still extant who regard the B-17 with a great deal of respect and affection. Have a care, sir!
W. G. Moore
Asheville, North Carolina
Tallman agrees that the B-17 was a fine plane, but he wanted to make the point that the B-17 was mass-produced with many problems in the early design. Author Edward Jablonski (Flying Fortresses) *notes that "enemy pilots quickly learned ... that the Flying Fortress* was *vulnerable to head-on attacks" and that it was modified "thousands of times." But he also quotes General Carl A. Spaatz: "Without the B-17 we might have lost the war." The B-17 gained maximum effectiveness when the proper fighter escort planes were developed.* Ed.

Dear Sir: The "Mission Completed" picture in your article on the "Confederate Air Force" came as a complete surprise to me. Thirty years have passed since I painted it. I last saw the B-24 Liberator bomber on which it appeared on our return from the Chinese-Burma-India theater in October 1945. I painted it while based as a pilot at Tezpur, India, for my squadron commander.

"Mission Completed" [see below] represented the fact that V-J had occurred and we were on our way home. This particular aircraft had recently arrived from the States, and it was chosen by the C.O. for the flight home.

Most of the painting was done by using artists' oils to tint any kind of paint I could find, thin with gasoline and spread with my limited brushes. I painted aircraft, usually in the early morning to avoid the heat. Often planes went out with partially completed paintings and, because of the types of paint used, often came back smeared and bleached out. My C.O. was able to tap better resources than I had, but I'm still amazed to see my 30-year-old painting.
Vernon L. Drake
Billings, Montana

Dear Sir: On a visit to Texas, this awe-struck female student of the air war dragged her patient husband several hundred miles to ogle the wondrous collection of World War II aircraft. After a satisfactory visit we prepared, with checkbook in hand, to enroll me as a member of the "colonels," only to be told that no ladies are allowed—they would be glad to have my husband join, but not me. Since it is I to whom the preservation of the planes is important, we declined.
Joyce Williams
Phoenix, Arizona

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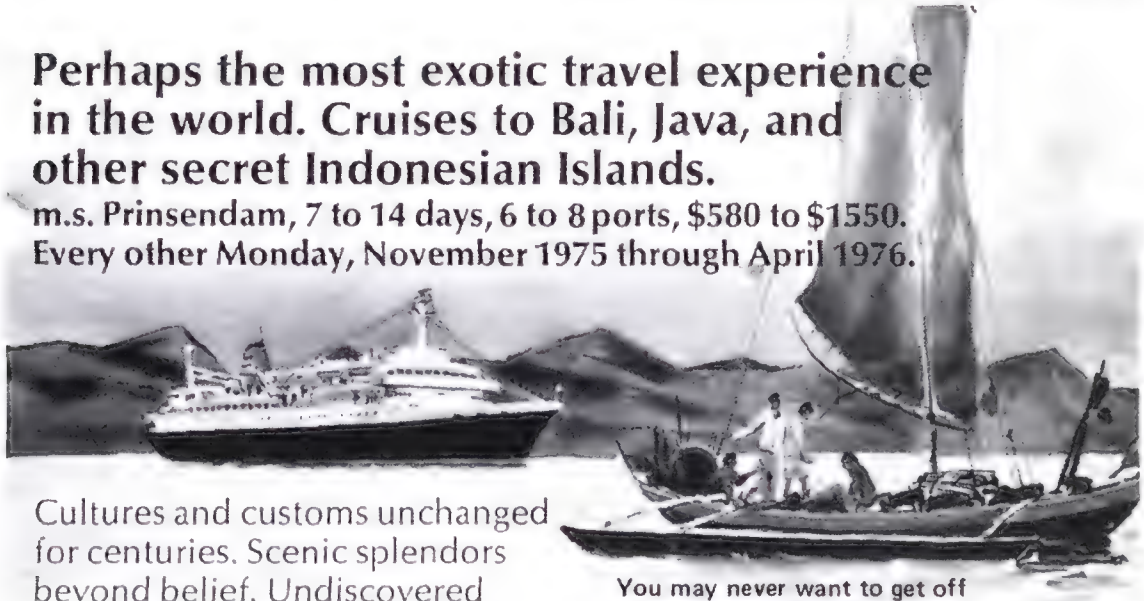

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Vitamin C

Dear Sir: According to "Phenomena, comment and notes," Dr. Leslie M. Klevay reported that consuming large amounts of vitamin C decreases the amount of copper that can be absorbed from food. In experiments with rats and mice, Dr. Klevay found that a high ratio of zinc to copper leads to an increase in cholesterol in the blood, which is believed to be a factor in coronaries.

On the contrary, it has been shown by British pathologist Dr. Constance Spittle [See SMITHSONIAN November 1974] and by a Czechoslovakian investigator, Dr. Emil Ginter, that a high intake of ascorbic acid leads to a decrease in the cholesterol concentration in the blood.

The concentration of cholesterol is determined by the rate at which it is manufactured in the human body and introduced by the intake of foods, together with the rate at which it is destroyed by conversion into bile acids. Dr. Ginter was able to show that a high intake of absorbic acid increases the rate of destruction of cholesterol, leading to a decrease in the concentration in the blood. There is also evidence that a high intake of ascorbic acid decreases the death rate, including deaths from heart disease.
Linus Pauling
Menlo Park, California

Bicentennial

Dear Sir: The excellent series, "200 years ago this month," by Edwards Park, has re-created the spirit of an entire era. In the space of mere paragraphs, he made history come alive. Is it possible to obtain reprints of the series?
Ralph A. Lombardi
Smithtown, New York
The entire series is in the process of being reprinted. Ed.

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Then why don't most of us end up with at least a million dollars by the time we're 65?

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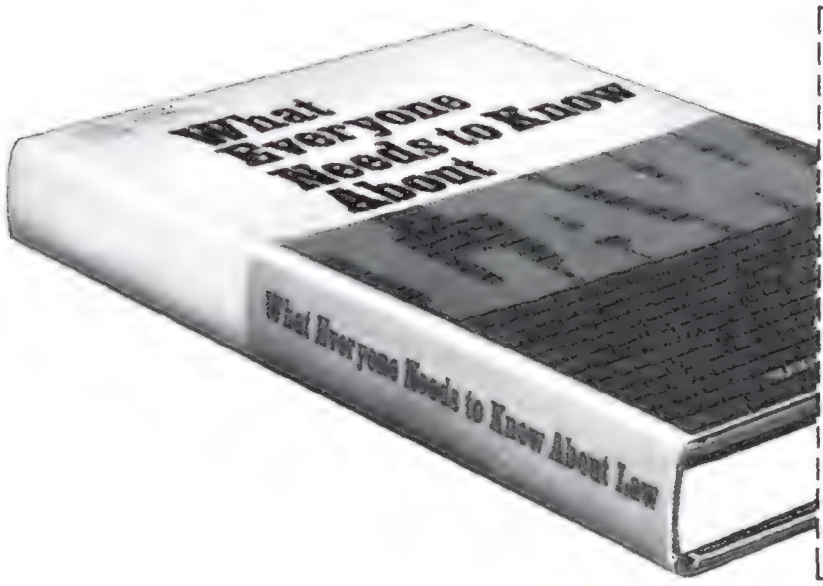

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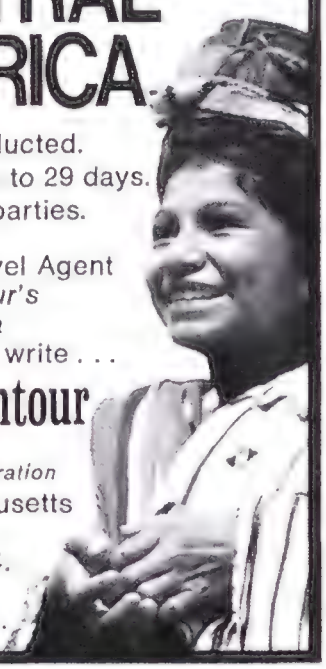

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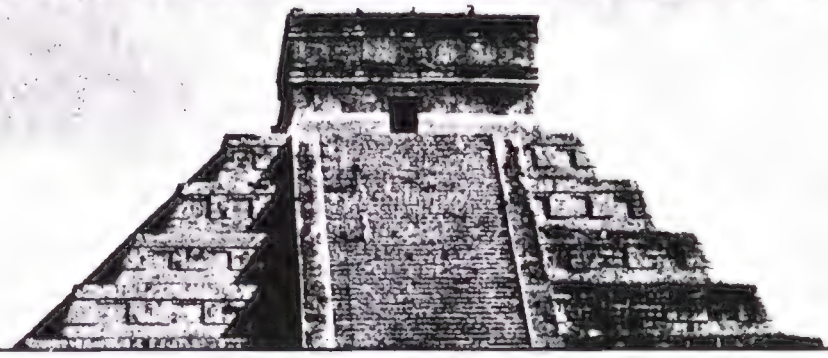

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PAQUÉT FRENCH CRUISES

Around the Mall and beyond

Ever determined to take up cudgels for wildlife, I whizzed over to the Smithsonian's National Zoological Park recently to see about the vultures. I'm referring to native American vultures, as "wild" as any bird can expect to be which spends much of its time soaring over the nation's capital. For decades they have dropped in at the zoo to feed and roost and sometimes breed. They have become an old, though hardly cherished, tradition. But this year they have gone.

Guy Greenwell, Curator of Birds, says that though the vultures often flake off in the heat of summer, this year they never attained their normal spring buildup. He blames all that new construction that is going on, renovating our old zoo. Some trees have to go, and the snarl of power saws from dawn until dark, day after day, proved just as discouraging to the vultures as to you and me.

I tried to talk to Greenwell in his office in the basement of the bird house. "Tried" because there was raucous competition from an assortment of macaws, cockatoos and other noisy exotics having their own conversation in some special cages outside Greenwell's door. The barks, howls, squeals, honks and whistles sounded like a dog fight in the midst of a Paris traffic jam.

I gleaned that the zoo hosted the two eastern American species of vulture, the black *(Coragyps atratus),* common enough in nearby Maryland and Virginia, and the turkey *(Cathartes aura),* a much shyer bird that looks somewhat like a sunburned businessman: black suit, bald red head and bags under the eyes.

Greenwell shouted—against the vehemently stated opinions of a macaw—that the black vultures sometimes nested, but that the turkey vultures came just to roost, not to breed. The birds would often line up on the railing above the bear den, hissing and shouldering until they were evenly spaced, about six inches apart, like guardsmen on parade. Then they would take turns flapping down to swipe a dead fish from the bears.

After feeding, the vultures would take off and get in a little soaring on the thermals rising from Washington's hot streets and rooftops. Finally they would sail off to the high banks of the Potomac and ride the hill currents there.

"Did they ever lay any eggs?" I yelled.

"We incubated one," Greenwell bellowed back.

It turns out that Mike Johnson, biological technician for the bird unit, raised a small black vulture named Vernon who now lives in a cage with a hooded vulture from Africa. Vernon is confined right now because one evening, when Greenwell had been working late and was the only one of Vernon's friends around, Vernon

followed him home. Greenwell walks to and from work and on this particular evening stroll, there was Vernon waddling and flapping along beside him, hissing at passersby. And when Greenwell noticed, and picked him up to carry him back to the zoo, Vernon bit him.

Vernon's fellow vultures may come back when the reconstruction project is finished—first the bold blacks, then, cautiously, the turkeys. But some of the zoo's neighboring Washingtonians would hardly shed a tear if they never saw another vulture. Residents at the nearby Kennedy-Warren apartments used to find the sight of 180 or so wheeling vultures, silent and ever watchful, right over their roof, uncomfortably portentous, especially to someone with a nasty hangover. But the birds had their share of fame in Washington. Foreign zoos sometimes requested a shipment of them. Mrs. Sybil Hamlet, Public Information Officer at the zoo, told me (in a normal voice, after I had bade farewell to Guy Greenwell and his high-decibel companions) that in the 1950s zoo people would box-trap a few vultures and send them off.

"Then the wire netting got all rusty, and we painted it with lovely black enamel," she said, "and from then on, not one bird would go inside. That was the end of our trapping."

Which proves that what seems lovely to a human does not necessarily seem lovely to a vulture. And, come to think of it, vice versa.

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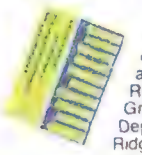

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The new CDR display dramatically increases legibility and battery life and opens a new era of watch technology.

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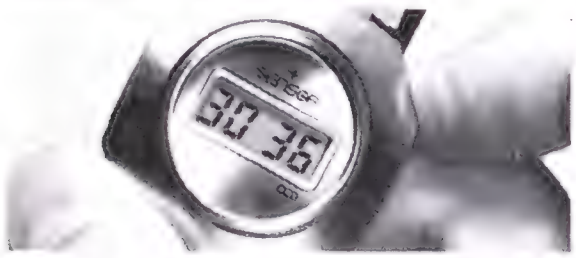
A glance at your solid-state watch won't give you the time. Sound incredible? If it's an LED (light-emitting diode) watch, you've got to press the button first. If it's an LCD (liquid crystal display) watch, you must have plenty of light at just the right angle.

Now there's a new solid-state display technology called CDR (crystal diffusion reflection) incorporating the best features of the LED and the LCD displays. You can easily and constantly read your watch under any light conditions without strain or inconvenience.

The new CDR display takes the properties of the field-effect liquid crystal display, puts a strong reflective substance behind two closely-alligned polarization lenses, and the resulting large digits can be read clearly from practically any angle. When engaged, an integrated light source illuminates the display at night. The Sensor's constantly "alive" high-contrast display makes legibility outstanding under **all** light conditions.



Press the button on the Sensor 770 and the date and seconds appear in large black numerals—easy to read in any light.

A WORRY-FREE WATCH

Solid-state watches pose their own problems. They're fragile, they must be pampered, and they require frequent service. Not Sensor! Here are just five common solid-state watch problems you can forget about with this advanced space-age timepiece:

1. Forget about batteries Sensor is powered by a single EverReady battery that will actually last years without replacement. In fact, if your battery fails during the first five years, we will replace it free of charge. A low-power indicator tells you when to change the battery one month in advance and you simply open the hatch at the back of your watch and replace the battery yourself.

2. Forget about water Take a shower or go swimming. The Sensor is so water-resistant that it withstands depths of up to 100 feet.

3. Forget about shocks A three foot drop onto a solid hardwood floor or a sudden jar. Sensor's solid case construction, dual strata crystal, and cushioned quartz timing circuit make it the most rugged solid-state quartz watch ever produced.

4. Forget about service The Sensor 770 has an unprecedented five-year parts and labor unconditional warranty. Each watch goes through weeks of aging, testing and quality control before assembly and final inspection. Service should never be required, but if it should anytime during the five year warranty period, we will pick up your Sensor at your door and send you a loaner watch while yours is repaired—all at our expense.

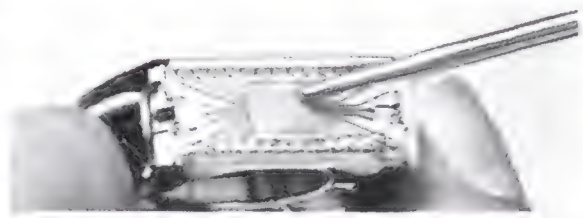
5. Forget about changing technology The Sensor is literally years ahead of every other watch in durability and technology. But should Sensor's technology improve anytime during the next five years, you may trade in your watch for Sensor's newer model under JS&A's liberal trade-in policy.

COMPARED TO EVERY OTHER

The $275 Pulsar uses the LED technology which requires pressing a button each time you want to review the time. Even the $500 solar-powered Synchronar watch, in our opinion, can't compare with the Sensor and its 5-year warranty. And no solid-state watch can compare to Sensor's quality, accuracy, ruggedness and exceptional value.

PLENTY OF ADVANCED FUNCTIONS

Sensor's five functions give you everything you really need in a solid-state watch. Your watch displays the hours and minutes constantly. Depress a button and your watch displays the seconds and date constantly. There's also an AM/PM indicator. To adjust the time, insert a ball-point pen into the four-channel time-control switch. Each channel independently controls one time function. In short, you can change the hours without affecting the date, and the minutes without affecting the hours.



A pin points to the new decoder/driver integrated circuit which takes the input from the oscillator countdown integrated circuit and computes the time while driving the display. This single space-age device replaces thousands of solid-state circuits and provides the utmost reliability—all unique to Sensor.

Sensor's accuracy is unparalleled. All solid-state digitals incorporate a quartz crystal. So does the Sensor. But crystals change frequency from aging and shock. And to reset them, the watch case must be opened and an air-tight seal broken which may affect the performance. In the Sensor, the crystal is first aged before it is installed, and secondly, it is actually cushioned in the case to absorb tremendous shock. The quartz crystal can also be adjusted through the battery compartment without opening the case. In short, your watch should be accurate to within 5 seconds per month and maintain that accuracy for years without adjustment and without ever opening the watch case.

STANDING BEHIND A PRODUCT

JS&A is America's largest single source of electronic calculators, digital watches and other space-age products. We have selected the Sensor as the most advanced American-made, solid-state timepiece ever produced. And we put our company and its full resources behind that selection. JS&A will unconditionally guarantee the Sensor—even the battery—for five years. We'll even send you a loaner watch to use while your watch is being repaired should it ever require repair. And our liberal trade-in policy guarantees that new watch technology will never leave you behind.

Wear the Sensor for one full month. If you are not convinced that the Sensor is the most rugged, precise, dependable and the finest quality solid-state watch in the world, return it for a prompt and courteous refund.

To order your Sensor, credit card buyers may simply call our toll-free number below or mail us a check in the amount indicated below plus $2.50 for postage, insurance and handling. (Illinois residents add 5% sales tax) We urge you, however, to act promptly and reserve your Sensor 770 today.

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On one rather famous occasion, a zoo vulture—a griffon vulture from western Asia, Africa and southern Europe—escaped and took a roost at the Alban Towers apartments on Massachusetts Avenue (Embassy Row, no less). The residents there rather liked their new neighbor and sent food up to it. "It was some kind of big," recalls one young man who was living there. "When it flew past my window the whole sky darkened."

The zoo people tried every which way to recapture the griffon, but it took off. Probably out there in Des Moines by now, making better friends than he would back in western Asia, Africa and southern Europe. Another prophet without honor. . . .

One of the first places in the zoo to get renovated was the monkey house. Already visitors are getting used to it, but I wonder how my friend *Lagothrix lagothrica* is making out. I first met him when his splendid new quarters were opened at a ceremony in May. It was a hot afternoon, and guests lined up at the two tables which had been set up in the air-conditioned expanse between the display rooms. These latter are sealed off with glass to keep out the air conditioning, which would give tropical animals chills, muffle the noise of sightseers and, as Zoo Director Theodore Reed said in his dedicatory remarks, "keep the monkeys from having to smell the people."

Now, Lagothrix is a woolly monkey from the Amazon Basin. He eats leaves, fruit and insects. Take it from me, he also can use a vodka and tonic if you offer him one.

The trouble was that, at the opening ceremony, no one did. So he sat at his window—cut low so children can look in—resting his hairy forearm on the sill and glowering. Just waiting.

I suppose that not everyone has been in a quiet local bar on a Tuesday night when the whole gang has cleared off except for one miserable old toper, hunched at one end of the mahogany, silently hoping that the bartender will relent and slide a pony of Old Apple up to him. After all, he really can't help it if he's a mean drunk. He really didn't intend causing all that trouble earlier in the evening. All he needs is just one more glop and he'll be good. Honest.

Well, that was my friend Lagothrix. The same patient waiting, the same disgusted glower at the waiter.

"Very little known about behavior in the wild," says the legend on his window.

I know something. He's obviously got the reputation of being a mean drunk.

Another notable opening a couple of months ago was that of "We the People," a grand pastiche of Americana that fills

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Deep in the Guatemalan jungle lies the ancient city of Tikal, whose very existence baffles archaeologists. Why the Mayans picked that remote location to build a city, how they built it, and why they abandoned it during its height of splendor, are just a few of the questions surrounding this unique place. It's only within the last 30 years that access through the jungle has enabled scientific exploration of 2500-year old Tikal. And it remains one of the most beautiful untouched wonders of the world.

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an entire section on the second floor of the Museum of History and Technology. There were more splendid hors d'oeuvres than you could sink up to the wrist in, and plenty of other good things, too. Secretary Ripley made a speech, a ribbon was cut and we all wandered into a fantasy world where all our national past seems to have been laid out just for the looking.

After some investigation, I decided that perhaps the most lavish item per cubic inch is Kokichi Mikimoto's pearl model of Mount Vernon, fabricated in Japan for the 1933 Century of Progress at Chicago. Its walls are of mother-of-pearl, as are its roof shingles. Cultured pearls top the porch railings, and the flagpole. They form the white stripes of the flag and the 48 stars.

A good bet for the least expensive exhibit is the "Johnny Horizon '76" hat. Either that or the blue denim duffel bag of FDR's Civilian Conservation Corps—but denim is hot stuff right now.

I noted that one of the larger displays is "Columbia," the big Rodgers hand pumper which teams of muscular young men used to haul around to fight Washington, D.C., fires in the 1850s. And for something petite, there are 11 clothespin patent models designed and made between 1858 and 1887. All are slightly different, and all are doing their job perfectly well, just as today's clothespins do. I guess that a clothespin is one of those things a human cannot do much with. Once you've invented it, you can only mess around with it a bit, not really improving it much, but giving you a small excuse to prove yourself sapient.

"We the People" covers our national history and our geography, but the orchestra that lightened our visit confined itself to ballroom music of the 19th century. I enjoyed it, but I always miss hearing "You Gotta See Mama Every Night or You Can't See Mama at All," which was on a black-labeled record that went on our wind-up Victrola on the back porch. The carousel outside the Arts and Industries Building, across the Mall from the Museum of History and Technology, played that on one (to me) happy afternoon two years ago. This summer it is full of turn-of-the-century ragtime—Scott Joplin type music—which is OK with me. I must learn more about how this machine is programmed.

EDWARDS PARK

British Columbia, Canada

These pictures are just a sample of what is waiting for you in British Columbia. 1. Fort Steele, once a gold rush boom town, growing old gracefully in the East Kootenays. 2. Downtown Vancouver as it looks from Kitsilano Beach (great fish and chips at the beach). 3. A fast fleet of ferries links the British Columbia mainland to Vancouver Island and the Gulf Islands. 4. One of the intriguing shops to be found throughout the Province—browse for treasures till teatime. For a lot more information write: British Columbia Department of Travel Industry, 1019 Wharf Street, Victoria, British Columbia V8W 2Z2. Or call your local travel agent.

For the autumn of a lifetime.

Text and photographs by Charles E. Rotkin

Big river barge operations would stun Mark Twain

Towboats shove instead of tow, and electronics eliminate the leadsman's singsong litany, but our river system greatly serves commerce

The author, a free-lance photographer, logged hundreds of miles for the material in this article.

"The *Roy Mechling* to the northbound boat around Old Lock 17, come in please."

"This is the *Charles Lehman* below Old Lock 17."

"This is the *Roy Mechling* southbound. I'm coming down by the carbon black plant."

"Captain, I don't know where that is, I'm kinda new up here. I'm about a half-mile below the Marietta Island Light. Have I got time to get out of here?"

"Well, let's see, Cap . . . it'll take us about 30 minutes to get down to Old 17. If you want to wait up underneath the lock or anywhere along that Ohio shore, from the Marietta Light on up, I can meet you on two. There's plenty of water. We'll keep a lookout for you on two, Cap. *Roy Mechling,* clear. . . ."

". . . *Roy Mechling* to *Charles Lehman,* I'm coming down the straightaway above the lock. How are you shaped up?"

"*Charles Lehman* to the *Roy Mechling.* We're coming through. I'm right down where you told me to be on the Ohio shore."

"You're doing fine, Cap. I'm looking right at your blinker light. Everything is looking good."

"Captain, how close can I come up along this shore?"

"Cap, that shore is good as gold all the way up to

A tow churns the Ohio River north of Cincinnati. Barges may stretch nearly a quarter of a mile.

Note how barges being pushed are stacked side by side and end to end to form this huge load.

Old Lock 17. I can see you pretty well down below the old dam. . . . You look good, Cap. You can shape yourself around the old lock wall. You'll be able to see the top of that lock wall sticking out with your searchlights and you'll be all right. We'll meet you on two. *Roy Mechling,* clear."

Thus Captain Robert W. Lips, Master of the motor vessel *Roy Mechling,* prepared to pass an upbound riverboat on the left and blew his big whistle twice to comply with the Rules of the Road. That was what he meant by "meet you on two." He also passed along some of the detailed knowledge he has acquired of every mile of the 981-mile Ohio River between Pittsburgh and Cairo, Illinois. Bob Lips has been a licensed river pilot for 39 years and a Master for 37 of them. Almost all of these years were with the Union Barge Line, which has recently been merged into the Union Mechling Corporation.

The Ohio is a major segment of the more than 25,000-mile inland and intracoastal waterway system of the United States. Though railroads, airlines, trucks and other transportation systems have suffered serious economic strains in the past few years, waterways are alive and booming. In 1973 about 136 million tons of cargo were transported on the Ohio. Since the boats and their barges travel almost anywhere along the Mississippi and Gulf systems, it's hard to separate Ohio River traffic, but there are some 4,000 towboats and 20,000 barges in the entire inland waterways system.

Many small towns, farming communities and industrial complexes line both banks of the Ohio, and the inhabitants vary from middle-European steelworkers and coal miners to German and Dutch farmers and craftsmen and Appalachian hill people. Before the lock and dam systems were constructed, the Ohio was navigable only for some four months of the year between the low water and the ice, so most rivermen were farmers at first, supplementing their living on the river. Many of the rivermen today are Southerners of small farm background.

Numerous navigable tributaries feed into the Ohio—the Kanawha, Green, Kentucky, Wabash and Cumberland—and hundreds of interstate transportation companies use the rivers to carry petroleum, chemicals, agricultural products, iron ore, limestone, bauxite and all manner of finished steel, aluminum and various manufactured products, as well as an overwhelming tonnage of coal.

Frederick Way jr., Ohio River historian and author, discusses a preserved stern-wheeler (background).

The *Roy Mechling*'s maid and cook get a suntan

In spite of its name, a towboat doesn't tow, it pushes or, in river parlance, shoves. It is an ungainly ark, flat-bottomed, light draft, with two huge bumpers in front called knees. After 150 years, riverboats have evolved from wood-burning side-wheelers and coal-or-oil-fired stern-wheelers into several generations of propeller-driven diesels (called "screw-wheel boats" when they first appeared).

Perhaps the most famous towboat of all was the mighty *Sprague,* more affectionately known as "Big Mama": 314 feet long, 61 feet wide with a 40-by-40-foot steam-driven paddlewheel. Most of the old steamboats carried freight on their main decks and passengers above, but *Sprague* was built as a towboat and commissioned in 1902 for the old Monongahela River Consolidated Coal and Coke Company, whose name was instantly shortened to "the Combine" by river captains trying to fill out store orders. Big Mama had 2,000 horsepower and carried a crew of between 50 and 60, including a galley crew of seven. Her principal function was to shove enormous loads of coal from the coal fields of Pennsylvania to the fast-growing South, and even today her record stands unchallenged. On one memorable trip she pushed 63 barges, each 175 feet long and carrying about 1,000 tons of coal, from Louisville to New Orleans. According to Captain Frederick Way jr., noted Ohio River historian, this was the biggest tonnage ever moved by man on a river.

On some of Big Mama's trips as many as two-thirds of her barges would be lost en route. They were flimsy and vulnerable to sandbars, storms and currents. They would be sold with the coal as a package after their arrival in New Orleans and dismantled plank by plank as the coal was unloaded. Many of the old wooden buildings in New Orleans' Vieux Carre were originally built from coal barge timbers: well-used Allegheny pine and hemlock.

In the early Forties Big Mama was laid up, primarily because the shipyards could no longer find oak timbers 40 feet long to replace her huge paddle wheel and because her operating costs were too high. She became a river museum at Vicksburg and last year burned. The beached hull is still on the riverbank and some efforts are being made to raise funds to restore her.

Life on the river has changed a good deal since Mark Twain took his pen name from the singsong litany of the leadsman, measuring the river depth: "quarter less twain," which is 10½ feet; "mark twain," 12 feet or two fathoms; "quarter twain," 13½ feet; "half twain," 15 feet; "quarter less tyree [three]," 16½ feet; "mark tyree," 18 feet; "quarter tyree," 19½ feet; "half tyree," 21 feet; "quarter less four," 22½ feet; "mark four," 24 feet, and so on.

Today, soundings are by Fathometer, and since the tow now can extend for a quarter of a mile or more, the cupped hands of the leadsman have been replaced by intercoms. The console of the towboat is clustered with other instruments. A swing meter measures the tracking of the head of the tow and the great swings necessary to run between the piers of a bridge or around a sharp bend. Multichannel VHF marine telephones allow talk between boats, shore installations and home offices.

Giant arc searchlights slash through the night with

on deck when free
of housekeeping duties.

Captain Bob Lips in the wheelhouse of *Roy Mechling* guides his string of barges past a point of land.

intense brilliance, illuminating the river ahead for miles. Elaborate radar sets flank steering and throttle controls so that even a new pilot can find his channel through fog, bridges, sandbars and other hazards. But navigation in the ever-increasing traffic is still tricky, and Captain Lips feels pretty strongly that an intimate personal knowledge of the river is absolutely essential. He makes his twice-monthly round trips between Pittsburgh and Cairo without ever referring to a chart. He told me that riverboat piloting is from one point to another, and it's done by conditioned reflex. Most of the people working in pilot houses today have never seen the river bottom because the flow is controlled. But those who once did would connect the bars with hilltops, valleys, farmhouses, stands of timber, bare spots on the bank, little coves. When the water rose in the spring, the captain knew his landmarks. Coming down on the head of Bat-n-Grape Island after Leith's Run, he might, perhaps, "put his bow on a notch in that there hill."

Hundreds of such marks are called tilling marks, named after the tiller—the control line that used to run from wheelhouse to rudder stocks. Navigating from one point to the other was called tilling. Today's lock and dam system has created a wider and deeper channel and affords the pilots a little more of what they call "slobbering room."

Crews work alternate six-hour watches and boats run continuously. Rarely do they tie up now for stores or fuel. Supply boats come out from various river ports and replenish the tows. Mail is brought on and laundry taken off while the tows are under way. A sick or injured crewman is treated by doctors who can be called quickly by marine telephone.

Captain Frederick Way jr. was a licensed steamboat captain long before he became an author and historian. He is now president of the Sons and Daughters of Pioneer Rivermen and publisher of the authoritative *Inland River Record,* an annual directory of all the boats using the Mississippi and Gulf systems. Now 74, he looks back on being owner-captain of the packet boat *Betsy Ann* that operated between Pittsburgh and Cincinnati from about 1923 to 1932.

"When I started on the river in 1915 or 1916, there had been no appreciable change in piloting methods since Mark Twain's time. The pilot could get along handsomely with a hand-steered pilot wheel, a tiller running back to the rudders and a headlight that sometimes lit and sometimes didn't. When it didn't, he would pick up a lump of coal and hit that headlight out there and it would light up again. He got to be a pretty good shot."

Legends abound about captains and tows. They say an old riverboat captain named McHarry insisted on being buried on a hillside standing straight up, facing the river, so that he could keep his eye on the river boats as they passed.

There is a story about a new pilot who succeeded in forcing a 112-foot wide tow into a 110-foot-wide lock chamber. The lock was closed to traffic for a week before the tow could be pried out. In the days of wood-burning side-wheelers, when navigation aids were strictly limited, the captain of the packet boat *Virginia* tied her off one foggy night during a flood water near

Ravenswood. Next morning the river had receded and there was the packet boat, high and dry in the middle of a cornfield.

The legends live on, but the old boats eventually go to the scrap yards or maybe wind up as restaurants. Big Mama has long been replaced by smaller, more efficient vessels with 12-man crews and generating 4,000-to-10,000-horsepower.

Big tows don't exceed seven miles per hour upstream, or 12 down, so life on board a tow is leisurely in terms of time. Crews work hard, literally wiring barges together with heavy steel cable, chains, hydraulic jacks and ratchets. These lashings have to be uncoupled whenever a barge is dropped off or picked up. Careful planning has to be made of the position of a barge in the tow; even the weight of the barge itself becomes a factor in its station.

Life on the river is almost familial. No riverboat ever passes another that has broken down without offering to put an engineer or mechanic on board. A gallon of ice cream may be exchanged for a fresh-caught fish. Crewmen whose time is up can be taken ashore by a passing pleasure boat or a harbor tug. Payment is usually a pound can of coffee or a slab of cake from the ship's galley.

River captains watch out for pleasure boats, because many are manned by weekend sailors who have no idea how unwieldy a big tow is. Fully loaded, a Mississippi tow can weigh 40,000 tons. After a couple of drinks, the Sunday mariner may think it great fun to cut in front of a tow loaded with steel and stone, nearly a quarter of a mile long, which cannot be stopped in much less than half a mile. More than one small boat has disappeared under the bow this way.

I recall one river trip when, waiting to enter a lock at night, the towboat's whistle began to blast a series of short toots. I rushed on deck to see one of the big arc

Mighty tow nears an Ohio River lock. Barge strings cannot be too long to negotiate river bends.

Towboat under construction shows framework for the tall "knees" that shove against a barge stern.

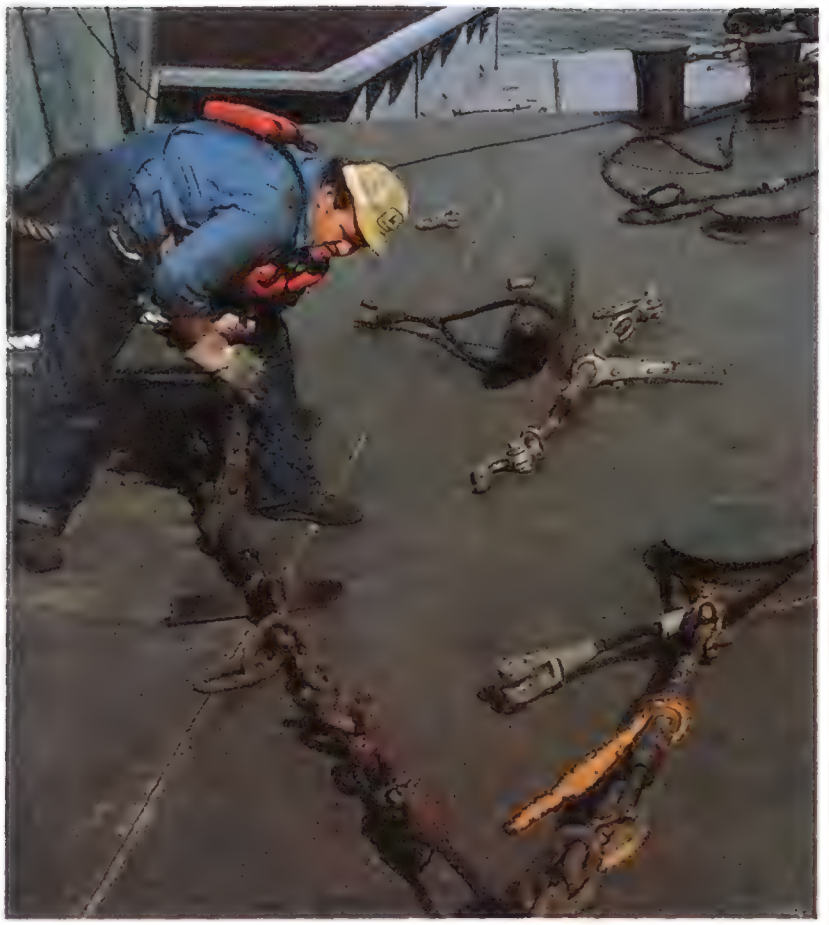
Downriver from Cincinnati, narrow old houses and church show in some ways life is the same.

searchlights focused on a river sign warning of a waterfall ahead and the other on the brink of the fall. A boatload of young people had ignored all warnings of the falls and was headed for destruction. The alert towboat skipper turned them away by a hair's breadth.

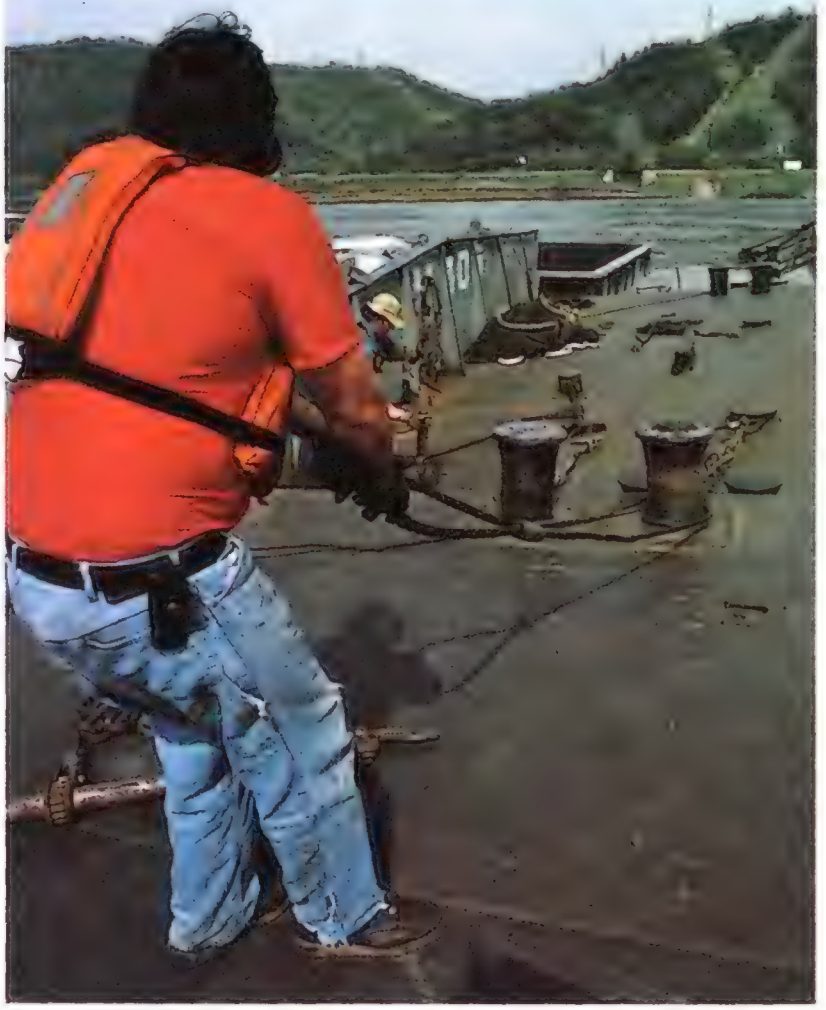
There is danger to the towboat crews, too. A snapped cable can cut a man in half. A cargo of gas or chemicals can be a hazard for everyone. But when things are going well, life on the river is serene. Crews work a month on and a month off, and while on duty rarely get off the tows. Television is their main source of entertainment.

Usually one woman does the cooking and some companies now carry maids for housekeeping. Food is simple, but overwhelming in quantity. "Steamboat eating" and "steamboat bellies" are traditional. Air-conditioning and private rooms for the crews are now standard equipment.

Mark Twain should have had it so good.



Deckhand tightens a giant turnbuckle to increase tension on cables that hold barge in position.



Another deckhand takes up slack. The backlash of a snapped cable can cut a man in two.

Towboat crewman lassos a bitt on the deck of a coal barge to secure it alongside.

Knees first, a towboat eases up to two barges to drive their coal cargo toward Ashland, Kentucky.

BOW
VILMINGTON. DEL

Text and paintings by Paul Horgan

He grew gardens in the earth and in the hearts of men

The Southwest's first archbishop, Lamy of Santa Fe, recently a Kentucky priest, reaches his diocese—larger than all France

Courtesy of Loretto Mother House, Nerinx, Kentucky

The real-life Lamy, known to readers of Willa Cather's *Death Comes for the Archbishop* as Bishop Latour.

Wars which change boundaries leave behind them unexpected details to be resolved when battles are over and treaties are signed. One such was the war with Mexico, fought in 1846-1848 over the annexation of Texas to the United States—an act which Mexico resisted but, in the end, accepted, ceding Texas, New Mexico, Arizona and California for a payment of $15 million.

At Baltimore in 1849 the U.S. bishops debated the problems created by the addition of vast new Catholic cultural lands to the expanding nation. Hearing reports of scandalous goings-on in religious and social affairs in New Mexico (which then included present-day Arizona), the bishops in council lost no time in finding a priest among the American clergy who could be sent to Santa Fe, which was now under the American flag.

Their choice fell upon an obscure French missioner at work as pastor in Covington, Kentucky. They nominated him to Pope Pius IX, and in 1850 he was made a bishop and assigned to New Mexico.

There he went the next year, arriving in midsummer. Nothing could have been further from Jean Baptiste Lamy's experience than the society he found at Santa Fe in 1851—he, a product of the decorum and piety of Auvergne in France, and the honorable if primitive life of rapidly developing Ohio and Kentucky between 1839 and 1849. In Santa Fe, the loose-living clergy received him with hostility; his legitimate claim to his post as bishop was challenged. He was appalled at the local morals, and, in short, saw a large task ahead.

Yet much of the local life, which was implanted when Spaniards from Mexico colonized New Mexico in 1598, had its charms and original styles; and Bishop —later Archbishop—Lamy came to love the land and the people, over which he presided as a prime civilizer of the American Southwest.

At stake was his authority over a diocese larger than France. New Mexico still loosely included all of present-day Arizona, and other areas imprecisely defined, which were part of the Mexican cession after the war. Lamy had already seen much of his new diocese, whose overall size was about 236,000 square miles, and if the desert seemed to predominate in its character, the country around Santa Fe had great variety. It lay at an altitude of 7,000 feet in the foothills of the Sangre de Cristo range, rising nearby in the east—wooded mountains, which took the sunset light in such color that the early Spaniards named them for the Blood of Christ. To the south were rolling hills dotted with piñon and juniper trees. Sixty miles away across a vast plain rose the superb arc of the Sandia Mountains at Albuquerque, and on the northern horizon was the grand line of the Jemez Mountains, beyond great barrancas of sandstone and earth, the color of rosy flesh, through which ran the Rio Grande on its 2,000-mile course

Until Lamy's arrival, Durango Cathedral, 1,500 miles from Santa Fe, was huge area's episcopal center.

from the Colorado Rockies to the Gulf of Mexico. Overall was a light so clear by day that prehistoric Indians named the place of Santa Fe "the dancing ground of the sun." The air was pungent with the exhalations of mountain forest and desert bush; and every play of mountain sky, with light and cloud, and every gradation of blue in the mountains from near to far, and the rustling cool under cottonwood groves in summer, and the warm sunlight of even the coldest winter day, when the smoke from hearth fires of piñon wood gave a resinous perfume over the town, brought a sense of thoughtless well-being to most people, and an awareness of unique beauty. The bishop found some 4,000 residents in Santa Fe, out of a total of 65,984 as reckoned in a census of New Mexico taken five months before his arrival.

The city seemed humbly like a very element of its natural surroundings. From a little distance, its houses merged into a likeness of some eroded earth outcropping, for they were all made of earth itself, in the form of adobes, or large shallow bricks molded from a mixture of mud and straw which when dried were strong and durable. To soldiers and traders from the East, the buildings seemed like wretched hovels, and Lamy himself said that his Mexicans had no other architecture but that of their mud houses, which used no boarding, and had almost no windows, and as for the churches, of which Santa Fe had five, they reminded him of nothing so much as "the stable of Bethlehem." (There was only one house in town with a peaked roof and shingles; it was put up during the war and was known as "*la casa Americana.*")

Yet there were graces and strengths in the local building style, for once off the street and through a blind door, which might be richly paneled and weathered to a silvery gray, the visitor saw a patio within, with trees rising above the flat-topped one-story rooms, and covered walks leading outdoors from one room to the others, for the rooms rarely opened into each other; and in the plaza of the town, the whole square was lined with such covered walks, or *portales,* for protection from sun, rain or snow.

The plaza, a rectangular park in the center of the city, was once the parade ground, or *plaza de armas,* of the Spanish garrison. In 1610 the government palace was built along its north side, and remained the official residence of governors for more than three centuries, under three regimes. As Lamy arrived, it housed also the chambers of legislation, the post office, the territorial library, and the ruins of a jail. The palace was a greatly enlarged version of the typical Santa Fe house. Its outer *portal* measured more than 300 feet in length, along one whole side of the plaza. It was the most impressive structure in the capital, and history had made it oddly beautiful. Always called the Governor's Palace, or the Old Palace, it would become in later times the historical branch of the Museum of New Mexico. High cottonwood trees towered within the patio gardens to shade the flat, low rooms.

All was as alien to Lamy as though he had been sent to a missionary station in remotest Africa. It must seem that he had only the primal materials of human society with which to work. In his vocation they were what counted most; but surely he must, when he could, work to bring them the bounties of such worlds as he had left. . . .

If the people he saw had variety in their looks—Mexican residents, United States traders and trappers and prospectors, Indians who wandered in and out of towns on obscure errands—there was still a prevailing look to the majority. This was the Latin-American

Paul Horgan, eminent historian and writer, spent 20 years on Lamy of Santa Fe, *to be published this month by Farrar, Straus & Giroux. This is an excerpt. (Horgan's watercolors are from those illustrating a special, signed $150 edition and are by courtesy of the American Literature Collection, Beinecke Rare Book and Manuscript Library, Yale University.)*

The bishop comes to Santa Fe

look. Santa Fe, all New Mexico, was still vastly more Mexican than anything else in appearance, ways, beliefs, degrees of knowledge and language. A soldier thought the people "the most abject contemptible objects" he ever saw, but allowing for various levels of prosperity, their dress reflected lively vanity. The men wore a brightly striped shoulder blanket or serape over a short jacket and ruffled or pleated shirt. Their trousers, thigh-tight, were held about the waist by a wrapped silk band. Among the relatively prosperous, the trousers were studded all down the outside seams with silver buttons. Horsemen by need and tradition, they strode and rode in boots high-heeled to hold securely in broad wooden stirrups, and their spurs were often of silver, with spiked ornamental rowels twice as big as poker chips. Topping all were "those everlasting big hats," as a trooper said—tall-crowned affairs, with very wide brims turned up at the edge, and traced with embroidery of gold or silver lace and little spots of mirror or bright metal. Their women went, by day, in blouses and skirts of varied color, and black shawls or rebozos which covered their hair and often their faces as a fold was flung across a shoulder.

When Lamy arrived there were already four Protestant ministers working to establish education where seven-eighths of the population was illiterate, and to wean the Mexican Catholics away from their religion of ritual and ardent practice.

The society's greatest concern was the constant yet unpredictable threat of raids by Indians of the roving tribes—Apaches, Navajos, Comanches, who were called by one observer in 1846 "the real masters of the country." A year before Lamy's arrival, a U.S. officer tallied losses to Indians of almost 50,000 animals, valued at $114,050, and added that this, a conservative estimate, could be increased by 50 percent. All too often inseparable from the incursions of raiding Indians after

San Francisco Street, Santa Fe, in 1865, and the old adobe church of St. Francis, Lamy's "cathedral."

horses, mules, cattle and sheep, were murders of their owners and destruction of property.

The territory was working to form itself politically—committees and conventions met, a New Mexico Legislature was formed, lobbyists were sent to Washington by groups of private citizens, the territorial spokesman R. H. Weightman, elected by the Legislature, struggled to bring before the Congress the outlandish realities of New Mexico.

But 64 years were to pass before the territory would become a state, and now in mid-19th century, emotional turmoil still lingered following upon great and dislocating events—Mexico's final separation from Spain in 1821, New Mexico's separation by war from the mother country of Mexico in 1847, the fast-growing commerce from the states across the prairies: in short, the intrusion of the world upon a land which for so long had lived on hearsay, with all its irrealisms. Much of the Mexican population was hostile to the power of the United States and its representatives. When Lamy arrived, representing still another non-Mexican power, they must however unwillingly accommodate to it, and to its disciplines.

Courtesy of The Museum of New Mexico, above and right

A salt train of burros, just in from surrounding desert, unloads its mineral harvest in early Santa Fe.

Still, in the meantime, there were immediate events exciting enough to make a day or a week festive and memorable. When a trading caravan neared the city after its long trudging journey over the plains, the wagoners whipped up their oxen to make a grand entrance into the plaza, circling the park, while a crowd of citizens, among whom local merchants were the most concerned, cheered and thronged. The arrival of a stagecoach was even more spectacular, for its horses could gallop where oxen lumbered, and the stage drivers yelled, the escorting horsemen fired pistols and the plaza became a circus ring. Goods and mail came with the drivers and passengers—and with them came the world.

It was, then, a society of contrasts, with its graces, luxuries, scarcities and disgraces. The stores on the plaza and the open markets in the square sold melons, peaches, grapes, onions, piñons, red peppers, cheese, light bread, dark bread from Taos, wood and fodder. Dry goods brought by the prairie wagons filled the shelves of shops established by enterprising German Jews who came with the early traders and who brought cultural styles and educated ways from Europe. In the clear late afternoons the daily promenade was staged, when young men walked together in a circle one way while young women walked in the other way, that they might face each other as they passed, and talk to each other by word or glance. Mounted on tiny burros, which in the daytime carried every sort of burden from bundles of firewood from the mountains to goods to be delivered for the shops, men and women trotted about during the social evenings.

The American conquerors had need of a hotel, and one—the Exchange—was built and later called La Fonda. "If you wanted an American visitor, you went there." It was, like the other local buildings, a one-story adobe affair, with long windows and wrought posts under its *portal*. Loungers sat there in their black American broadcloth, rakish hats and full whiskers, tilting their chairs back with their feet up on the *portal* posts in native American manner, picking their teeth after a family-style meal. The local newspaper, the *Santa Fe Republican,* edited by a soldier who had come with General Kearny in 1846, advertised other accommodations, including the "best of liquors, oysters, and sardines," and carried a notice to say that

Horgan refers to his watercolors as field-study sketches. This is the Plaza Alamos in Sonora, Mexico.

San Xavier del Bac, Tucson, abandoned 18th-century Jesuit mission church

"Mrs. G. de Habile, recently arrived from New Orleans, La., will be pleased to receive a few more gentlemen as boarders and flatters herself that her efforts to please will, as heretofore, succeed." Lamy could see about 25 stores, a printing shop, many saloons, two tailor shops, two shoemaker's stalls, one apothecary, a bakery and two blacksmithies. On a hill to the northeast, only a few hundred yards from the plaza, and so commanding the heart of the city, stood the artillery emplacements and riflemen's traverses of Fort Marcy, built in 1846.

The Third U.S. Infantry now occupied the garrison, and the local department commander, Colonel E. V. Sumner, who had arrived about a month before Lamy, was in open conflict with the civil territorial governor, J. S. Calhoun. The governor asked for arms from the military to distribute to the volunteer company of U.S. citizens he had raised by proclamation for their own protection against the Indians, particularly the Apaches and Navajos. Sumner refused; but the governor was persistent, and the problem of Indian terrors was too real to be ignored.

"The Navajos are a terror to all the people around," wrote an American soldier, "they descend from the mountains and sweep away the *caballadas* [horse herds] of the Pueblos and Mexicans, who look on unresistingly." Another saw in 1850 that "the hillsides and the plains that were in days past covered with sheep and cattle are now bare in many parts of the state, yet the work of plunder still goes on! The predatory operations [of the Navajos and Apaches] are even now carried on in the close vicinity of our military posts; the shepherds are pounced upon and shot with arrows to prevent their carrying information, and with their spoil the Indians dash with speed to the mountains and are beyond reach before the loss is known. In this way (I mean now the Apaches only) they run the flocks from seventy to one hundred miles in twenty-four hours. And, consequently, out of ten thousand sheep that may be started, probably not more than one thousand will reach their destination. As the overdriven animals falter from exhaustion those that do not fall dead by the wayside are lanced as the Indians pass to prevent their falling again into the hands of the Mexicans. . . . The more provident Navajoe [sic] is more careful, because his principal object is to increase his stock at home. . . . They were on several occasions pursued by the troops, but without success." There had even been traffic in the sale of Mexican children abducted by Indians.

rehabilitated by Lamy's boyhood friend and deputy, Bishop Machebeuf.

Tumacácori Mission, 48 miles south of Tucson. Built by Franciscans, dedicated in 1822, abandoned in 1827.

Governor Calhoun wrote to President Fillmore. "Until the Apaches and Navajos are completely subdued, we can neither have quiet or prosperity in this territory. You are aware that our treasury is empty, and that we are without munitions of war." Calhoun believed that if given munitions and other means he could, "in a few months, secure a lasting peace with the Indians in this territory, and locate them within fixed limits." He had been an Indian agent before being designated territorial governor, and he believed he understood the problem—from which he exempted the Pueblo Indians. These people were peaceable in their "archaic city-republics which line the Rio Grande," and were "intelligent, moral, sober, and industrious"—this by a soldier in 1850—"and, generally speaking, better off than the lower class of Mexicans."

Pressing for his volunteer company, and a supply of armaments from the military, the governor was able to persuade Sumner to agree in the end—but with conditions: The colonel stipulated that whatever arms he supplied must be given only as a loan, that they be returned to the military authority on demand, and that no expeditions of protection or reprisal be made against Indian raiders unless volunteers should be "acting in conjunction with the regular troops." The conditions attached by the colonel were unacceptable to the governor; not only for practical reasons, but because in 1849 responsibility for disciplining Indians had been transferred by law from the military establishment to the Department of the Interior, to which territorial governors reported. It was a live issue at the time of Lamy's arrival at Santa Fe.

But it could not be one whose solution must engage him to any extent personally—though he would often enough be exposed to its perils. He established courteous relations with Calhoun—and with all succeeding civil authorities— but his concern lay with the physical condition of his churches, the spiritual state of his parishes, the social and moral ignorance which flourished in Santa Fe's isolation from the world, and finally in every aspect of the waywardness all too evident among the local clergy.

Lamy chose the parish church of St. Francis as his cathedral. This was adjacent to the dean's house, where he took up residence at the beginning, and was a walk of two or three minutes from the plaza, at the head of San Francisco street. Rising above all the flat roofs with its twin towers crenellated in mud bricks, it was the largest building in the city. It had transepts lower than the nave—all the churches in Santa Fe, re-

ported Lamy, were in the shape of a cross; and all were built of the same humble material as the houses. It was amazing how old some of these were, and how long the dusty or muddy walls could stand against the weather, even without the annual replastering of earth which it was the local habit to apply. But all were in poor repair, like those he had seen on his journey northward from the Mexican boundary. Dried earth sifting downward by day between the wooden beams which supported the packed earthen roofs—it was a metaphor for the constant decay and necessary renewal of the Church itself in that land.

And yet among the native families there were seeds of faith and learning which took root where they could grow, however obscurely, in the minds and habits of children. A later churchman saw how the culture of Christianity was transmitted from adult to child, at home. The invisible company of Christ, the Holy Family, the saints, became a reality to those who could not read or write, but who could listen, who could look at the carved and painted wooden household figures of the sacred company of history, and form a second world where the heart and soul could dwell intimately with greater affairs and higher manners than the rude conditions of daily life. "Prayers and catechism," wrote the churchman, "were taught orally to the young children by some member of the family or by some trusty person of the neighborhood, and repeated word for word, question after question, until some part of the lesson would remain in the memory of the hearers. This was a hard work, but a meritorious one, and one of great value to the missionary, who had only to explain the mysteries and the chief points of our religion to the children thus instructed at home. . . . Every evening it was customary to make the children say some prayers which always terminated with the words: *'Bendito y alabado sea el Santisimo Sacramento del Altar* (Blessed and hallowed by the most holy Sacrament of the Altar).' After this, the innocent creatures, still kneeling, had to kiss the hand of their parents and receive their blessing before going off to their beds."

Adults used holy ceremony even in casual moments. Visiting, when a door was opened to them, they said *"Deo gratias"* or *"Ave Maria Purissima,"* and whoever admitted them replied, *"Para siempre bendito sea Dios y la siempre Virgen Maria—pase adelante* (Blessed be God and the ever Virgin Mary—come right in)." Simple greetings were invocations—*"Buenos dias* [or *Buenas tardes*] *le dé Dios* (God give you good day [or evening])," and the reply came, *"Que Dios so los dé buenos a Ud.* (May they be good to you from God)." In a casual meeting, the first one to say *"Ave Maria"* could properly expect the other to recite the whole "Hail Mary" for his intention. The most immediate terms of history were those of the passion of Christ, with all its characters. Holy Week was a drama lasting seven days, with the crucifixion and the resurrection as their climaxes.

But the religion was lighthearted, too, in suitable seasons—at Christmas fandangos, when the roof-lines of houses were traced by rows of *farolitos,* or candle lights protected from the wind, and bundles of piñon faggots (*luminarios*) were lighted to outline the plaza; the dancers within, wearing masks, played a famous joke. Young women holding eggshells filled with scented liquids pursued men on whose heads they smashed the eggs, in mixed compliment and mockery. "Another evidence of the Catholic Church in New Mexico," wryly noted an Easterner who spoke as a U.S. Puritan, "was the attendance at Mass of devout women, of whom not one was supposed to be virtuous"; and other traders and soldiers concluded that the native women were for the most part prostitutes—an unfair assumption based on the newcomers' lack of acquaintance with the seemly private life of most colonial Spanish and Mexican families. But if a certain class of females was available to invading frontier males, it was not to be wondered at, with the introduction of thousands of newcomers who had money to spend in a society so poor and by temperament so ardent in character and so indolent concerning work. A complacent observer who came with the American occupation thought that he could presently discern, "here in Santa Fe, the diminution of filth in the streets, and the improved dress and personal cleanliness of the people, together with the cloaking of immorality," which "showed that pre-

Three miles from Santa Fe: Lamy's *ranchito,* Villa Pintoresca—two rooms for rest, meditation and work.

cept and example [were] not altogether thrown away."

And yet others felt the "kindness of the people—they loaded us with presents," tobacco, food, and always showed politeness. There was true poverty in a land of potential riches. As Lamy wrote to Paris, 20 days after his entry, "it is a mistake to think the country is rich. . . ." Perhaps it was so in agriculture, "but gold mines and copper mines are in the hands of Indian tribes, who are ferocious and spread throughout the country," and he concluded that the country has "suffered greatly since the declaration of [Mexican] Independence. Franciscans [had been] obliged to abandon their posts. To replace them, secular priests were sent from Mexico, but in insufficient number—there were 15, 6 of whom are now old—But these priests . . . could not replace their predecessors; even now they are either incapable or unworthy." There was scarcely anything which Lamy met which might encourage him. "Almost everything needed to be created," except the touching and curious grace kept by the annexed Mexicans despite their poverty and the new ways to which they were subject after the war which their country had lost, and which had brought their new bishop among them. . . .

* * *

At the end of his 37 years as bishop and archbishop in Santa Fe, Lamy's legacy had countless expressions. One was his genius for making gardens and cultivating the earth's graces of crops and the shade of trees in a desert land of brilliant sun.

He died at Santa Fe in his 74th year, in 1888. In his home village of Lempdes, in Auvergne, they said that "His death was the end of a fine day"—*"Sa mort a été le fin d'un beau jour."*

* * *

In the next summertime the archbishop's garden yielded 1,500 quarts of strawberries, 40 gallons of cherries, 1,000 of currants, and 200 of raspberries; while 5,000 shrubs, vines and young trees which were ready for transplanting from the garden were auctioned for charity in the plaza at Santa Fe.

Hazel Hawthorne Werner, retired author, grande dame of Provincetown, owns the shack named Euphoria and hikes to it barefoot across the sands, as she has done for 50 years.

Text and photographs by William Oscar Johnson

Provincetown's dunes: a love story

A magical stretch of wild beach, a part of Cape Cod National Seashore and of literary history, is still home to a lingering few

The shack is armored with gray shingles, rippled and rubbed smooth by the grinding sandy wind. It is only about 11 feet square, a stubborn little box set on posts on a sand dune. It shudders in the stiff summer winds blowing off the Atlantic, but it is sound and the roof does not leak. The inner walls are unfinished lumber, and there is a raw plank floor worn quite silky by sandy bare feet. There is no electricity, no running water; candles and a nickel-plated kerosene lamp light the nights. There is a hand pump at the bottom of a sand dune. The pump water is sweet beyond belief.

The shack is named Euphoria and it looks down in peace on the waters of the Peaked Hill Bars. It is located about a mile or so over the great sand dunes behind Provincetown, on a grand and desolate stretch of Cape Cod known as the Back Side.

All of this—the shack named Euphoria, the magnificent brooding dunes, the tossing green sea, the great swath of untrammeled beach—is now part of the Cape Cod National Seashore, a vast, splendid federal park which covers about 27,000 acres along 50 miles of the Cape Cod coast. This is a precious, fragile preserve, carefully protected from the ravages of commerce.

Euphoria is owned by a lovely grande dame of Provincetown named Hazel Hawthorne Werner. She is in her seventies, a novelist who published books and *New Yorker* short stories in the Thirties. She lives now in a vine-cloaked refurbished garage in town, surrounded by books and poetry and works of art by old friends. Hazel's hair is frosty white and her gait is uncertain, for she is afflicted with an illness that tilts her balance and distorts her vision. Yet, with a worn gray rucksack on her back and a sturdy stick in her hand, Hazel still often makes the long walk across the sand from Provincetown to Euphoria. It is more than 50 years now that she has been taking that hike, and she recalls her earliest days there with a beatific smile and a quavery happy voice: "When I was a young girl I would walk into town for parties in the evenings and sometimes I would stay so late that I slept on the wharf by the old sail loft. When the sun began to rise, I would walk home. There are always large pools of sweet water in the dunes, cool and no deeper than your hand. I remember many mornings, returning from town, when I would see such a pool and I would strip off my clothes and roll its full length. I felt that I had washed off the sins and foolishness of the town."

Hazel went seeking her first shack after she had dreamed in New York of a small hut perched on a cliff above the ocean; she convinced her first husband to walk the coast of Cape Cod until they found something like it: "We carried a blanket and slept on the sand," she recalls. "We walked until we were near Provincetown. Then I saw Agnes O'Neill, Eugene O'Neill's second wife, walking into town from Peaked Hill. I had known her in New York in 1918 and when I told her of our search, Agnes said that we must go to the Coast Guard station above the beach and ask the skipper if there was a spare shack. You see, the men out there had a lot of extra time and would hammer together huts out of driftwood for their wives and families, or for a little extra income from renting them out. My shack was there, almost as I had dreamed it, of course. We rented it for $12 a month."

That first shack was not Euphoria; it disintegrated years ago. Euphoria was actually built in the Thirties, and Hazel also owns another shack half a mile up the beach. There are perhaps a dozen shacks remaining on the dunes now, and they will be extinct quite soon. The National Seashore authorities have an agreement with most owners that lets them use their shacks as long as they live. When the owners die, the park rangers will perhaps burn the shacks or bulldoze them down. "We do not know," said Hazel. "Maybe the rangers will merely board them up and leave them standing on the dunes like shrines."

Nothing is still and nothing is permanent in the dunes. The sea and the wind and the sand are constantly moving. Some dunes "march" as much as 15 feet a year, and perhaps it is this eternal restlessness that gives the dunes the odd feeling of being some*one*

Mr. Johnson of Sports Illustrated *described the life of women and children in the new China in the August 1974 issue of* SMITHSONIAN.

John Alexander, once a fisherman, now engraver of scrimshaw, exults in the dunes.

instead of some*thing*. There is an almost animal energy in the shifting sand as it heaps itself into peaks or sifts out of scooped pits or merely stretches grandly.

The light in the dunes is mystical in its clarity. Beams of the sun set up an infinity of refractions and reflections within the tiny bright casts and dazzling facets of a trillion grains of sand. Sunlight plays on the shimmering blades of grass, on the spray of the salt water, on the tossing surface of the sea.

Always there is the wind, sometimes merely a breeze that flutters the petals of the salt-spray roses; sometimes brisk gusts that bend the tips of beach grass to the sand where they make perfect arcs; sometimes black gales which pound the walls of Euphoria as if the great fist of Cape Cod itself had twisted about to hammer the shack.

John Alexander is a small, hard-muscled fellow with a bronze sunburned face and long black hair worn in a ponytail. He has a gray-black goatee. Seeing John Alexander, you might think of D'Artagnan of the Musketeers but he is, in fact, a former Provincetown fisherman, a carpenter, a landscaper, a member in good standing of the volunteer fire department as well as the local men's club, The Sons of the Beach. Stricken by a massive heart attack a few years ago, John Alexander now makes his living as a scrimshaw engraver, etching peace symbols and fish sketches on the ribs of whales to make trinkets which he sells in his own shop. John Alexander is the great-great-grandson of a Portuguese who migrated to Cape Cod from the Azores. His wife is a direct descendant of a signer of the *Mayflower* Compact.

Like Hazel Werner, John Alexander adores the dunes of the Province Lands as if they were a lovely unspoiled child. "I shake when I think what might have happened out here," says John. "Gawd, gawd*dam*! The National Seashore saved this from an awful fate. This could've been full of hamburger stands and drugstores, you know. This could be what Provincetown is."

What Provincetown is now is a meandering lovely old town, quaint and unselfconscious, full of its own gossip and its own character—at any time of the year but summer, that is. In summer, Provincetown is a struggling clot of tourists, blocked by snail-slow cars and snarled with aimless mobs of people wearing cheap new sneakers. It is rife with garish shops which sell rubber lizards, dark glasses and foot-long hot dogs. To escape such madding knotted congestion is to find the purest freedom. When John Alexander, aged 57, is in the dunes, far away from the summer swarms of Provincetown, he is like an exuberant joyful boy. He flings out one hand which is grasping a lovely lethal *Amanita muscaria*—a soft golden-orange mushroom, and he cries, "Gawd, don't eat *this!* You'll be dead by dawn." He holds out his other hand in which he has a scrap of driftwood. "Look at that! Just look! Gawddam! It's a *whale!* See the tail? See the mouth?"

For him there is delight in every bloom, every heartbeat on the dunes. He can barely contain himself: "Gawddam! . . . look at those beach pea blossoms . . .

Howard Mitcham, deaf since childhood, still shouts his poetry into the ocean wind.

look at that yellow carpet from the poverty grass blooms . . . there's a bearberry bush . . . look at the goldenrod . . . at the tree swallows . . . at the sand dollars . . . at the dusty miller leaves. . . ."

Later, he speaks more quietly: "I used to know the poets and painters around Provincetown. They always saw the dunes and the sea on the *big* scale. They liked the panorama. But *I* see the detail in the dunes. I love every gawddam *little* thing."

It has been years now, decades, since any ship ran aground on the Peaked Hill Bars. Yet there is still evidence of disaster on the beach below Euphoria—here and there a wooden keel, bleached now and smooth, or the dark brown rusted boiler plates of some lost ship, lying stark as some bit of modern sculpture on a smooth floor of sand. Off across the sand and scrub brush beyond the shack stands a lonely wooden yardarm. Once, 60 years ago or more, it was a practice target for men of the U.S. Life-Saving Service (later, the U.S. Coast Guard) who used it to sharpen their prowess at firing rescue lines from shore to wallowing ship. There is also an abandoned boathouse there with yawning, haunted doors and windows. This is all that is left of the heroes and heroics which once were common on the beach off the Peaked Hill Bars. Indeed, as steam-powered ships replaced sailing vessels, the fearsome bars lost their reputation as the Ocean Graveyard. The Life-Saving Station on Peaked Hill was abandoned and, in the 1920s, the dunes of the Province Lands came to be inhabited mainly by a different breed of men—esthetes and escapists.

At one point Eugene O'Neill moved into the station and wrote some of his finest dramas there, including *Anna Christie*. Hazel Werner recalled: "Eugene was a swimmer and I saw him many days stroking off the beach. I would wave sometimes and he would wave back. He had a smile that was brilliant, so happy, when he was swimming. It was a smile you never saw when he was on land."

For a couple of summers in the Twenties, O'Neill rented the station to his friend Edmund Wilson. Brilliant though he was with a pen, Wilson was a bumbler at the less exalted pursuits of the dunes. Once, when the hand pump broke down, Wilson shaved himself with ginger ale for several days before someone came to fix it. On one memorable summer afternoon, Wilson sat up on his dune watching anxiously as three exhausted swimmers were pulled onto the beach by Coast Guardsmen. When the three half-dead forms at last lay wheezing on the beach, Wilson dashed down to do what he could to help. He brought with him the only things he could conceive of to cheer up the victims: a box of crackers and a jar of anchovy paste.

Another literary celebrity of the dunes was Harry Kemp, the tramp poet who lived most of his life in Provincetown. There is a street there named for him. "Harry was a bore," says Hazel Werner. "He used to put down some bit of doggerel, and he would pound on people's doors at midnight, shouting his lines and crying out, 'Hear that? I've just written the greatest sonnet since Shakespeare.' We would have to calm him down and send him home. I never thought of Harry Kemp as a first-rate poet, although he was widely known as a jolly drunk."

Fur in the oatmeal, a glove in the stew

Harry Kemp was as renowned for his careless personal hygiene as he was for his drunken poetry. He once hung a fur coat high on a hook in his shack and left it there for the entire summer. In the fall, when he wanted the coat, he was astonished to find that the fur had fallen out and only the skin remained. He was even more baffled trying to figure out where the fallen fur had gone—until he discovered that his sack of oatmeal was directly under the coat. He assumed, and gave no further thought to it, that he had probably eaten the fur with the oatmeal during the summer.

Harry Kemp's stew was infamous, too, for he kept a pot boiling constantly, replenishing it from time to time. One day, Harry finally got to the bottom of the pot and, to the anguish of a visitor, he pulled a limp and bedraggled item out of the stew and cried out with delight that it was a glove—the very glove he had used to handle the kerosene for his lamps. "Thank God!" he said. "I never knew where I lost it."

All manner of escapists have populated the dunes. There was once a pair of lovers who built separate shacks upon adjacent peaks to keep their affair a secret, but then put up a mutual privy between which they named the Delphic Oracle. There was a fellow who flew down from Boston with his mother-in-law, strode purposefully to the beach from the airport, and there joyously stripped off his clothes, bundled them up and marched off nude, arm-in-arm with his mother-in-law, to his shack where he wore nothing at all during his entire stay except for a straw hat.

Howard Mitcham is a flamboyant, shaggy fellow with a barrel torso that has grown a bit rounder than mere portliness. His ruddy puffed cheeks and his tangled halo of gray curls make him look a little like a children's book illustration of Old Mother West Wind. Howard Mitcham is 58, a sometime columnist for the *Provincetown Advocate,* once a painter, a locally celebrated chef, formerly a promising poet and novelist who recalls with pride that he once took a creative writing course at LSU in which his teacher was Robert Penn Warren and two classmates were Robert Lowell and Jean Stafford.

Mitcham appeared at the shack Euphoria one dazzling windy afternoon. He stood at the rim of the dune and glared across the sand toward town, toward the slim gray gingerbread chimney of the Pilgrim's Monument which juts above the hills.

Howard Mitcham began to bellow—an oddly flat and inflectionless sound. His words were buttered with a thick southern accent. Howard Mitcham is deaf as a sea clam and he has heard no sound since he was a little boy. The last spoken words to register in his mind were uttered in the slow drawling syllables of little black children he played with in Louisiana. Thus, Howard Mitcham still drawls, too.

So he was shouting across the dunes and he couldn't himself hear what he said. "They are shrinkin'," he roared. He shook his fist. "They are vanishin.' They are disappearin' as we watch 'em."

He hurried back into the shack to avoid the tragic sight of the diminishing dunes and gratefully consumed some vodka. He seemed momentarily calmed and he gazed briefly at the plain plank table.

"Nohman Mailah wrote some of his best stuff right on those boahds!" He paused, then said, "This whole National Seashoah should be forbidden to everyone 'ceptin' ahtists and writahs and poets! The National Seashoah saved this land from pirates. No doubt!"

Hazel Werner remembers a poignant scene with Howard. "We were walking slowly through the dunes late one afternoon and there was a beautiful sunset. We were identifying plants and blossoms as we strolled along. Then Mitcham stopped. He looked about and turned to me and shouted, *'I s'pose the birds must be singin' now, huh? The birds must be singin' all 'round us.'* I nodded. Mitcham was silent for a moment, then he said, *'Must be mighty nice! Mighty nice! Birds singin' must be mighty nice!'* Then he walked on. There was no bitterness or self-pity in his voice."

This time Howard Mitcham drank a little more vodka, then shook a finger and said, "Don't fohget! It's pronounced Peak-ed, not Peakd Hill Bahs!" He gazed out the windows, now rattling in the wind. Then he rushed out of the shack, up on a dune and stood facing the foaming shoals below. "I wrote this poem 24 yeahs ago! Twenty-foah yeahs ago when I was a young man! I named it *Peaked Hill Bahs*!" And in his drawling monotone he began to shout into the evening wind:

On the full of the moon
And the Spring tides rise,
The ghosts of drownded mariners
Play ring around the rosy
With fearful clatter and groan
On the foaming Peaked Hill Bars.
On the wane of the moon
And the neap tides ebb,
They rest,
At peace with their nervous bones.

The shack Euphoria stands alone amid sand and sky, already a shrine to people of the dunes.

Happy Birthday, Frank!

The most popular frank of all, the skinless frank, was born 50 years ago.

We know because we're the ones who developed it.

First we came up with a cellulose skin that shapes the frank but can be removed after processing.

Then we worked with meat packers to find ways to make the frank better and tastier. And to process it at high speed so the price would stay low.

As a result, the frankfurter became one of the most popular food items in the world.

Last year, Americans ate 21 billion frankfurters. Most of them were made with our casing.

The same type of cellulose film also goes around many other delicious things. Bologna, pepperoni, kielbasa, kosher salami, bratwurst — you name it.

Other films we make help preserve the freshness of meats and poultry right to your table.

And, of course, you know about our GLAD bags and wraps.

As for frank's birthday, if you'd like to help us celebrate it, just look in your refrigerator. The guest of honor is probably in there.

UNION CARBIDE

Today, something we do will touch your life.

College student Gary Martini clambers up a huge ceiba tree toward canopy of forest.

Barro Colorado is a Noah's ark in the rain forest

By Don Moser

An island in the Panama Canal, an outpost of the Smithsonian, is a haven for fauna and flora and the biologists who study them

All morning I had followed a lanky graduate student named Russ Mittermeier along the jungle trails. Between the heat and the near 100 percent humidity, I had already stopped a couple of times to wring the sweat out of my shirt, and my face felt like a radiator about to boil over. I was so preoccupied with my own discomfort that when Russ stopped I almost walked into his back. Suddenly he started

Photographs by George Silk

Dr. Nicholas Smythe, a Smithsonian resident scientist, checks his trap used to monitor insect populations.

Graduate student Sally Levings surveys area where ant community structure is being studied.

bouncing all over the trail. He jumped up and down, weaved from side to side, and grunted like a karate instructor. I looked around him, and saw on the trail in front of us a big black and yellow snake with its body looped into ready coils.

"Ha!" Russ said, feinting a grab at the snake and bounding back. "If you get them mad," he said over his shoulder, "you have a better chance of catching them because they'll stand their ground." The snake, which looked both willing and able to stand its ground against a tank battalion, opened its mouth so wide I could see the pink lining inside, and then it struck swiftly. Russ dodged, bobbed forward again. For a moment he and the snake continued their pas de deux, and then Russ tossed a cloth collecting sack on top of the snake and pressed his foot down on the squirming loops. He felt under the sack with his fingers and a moment later came up with the snake, its head gripped firmly in his fist, its thick body dangling all the way to the ground. "Tropical ratsnake," he said. "What a beauty!"

The heat, the snake and the enthusiastic student were all standard ingredients of a typical day on that Noah's ark called Barro Colorado.

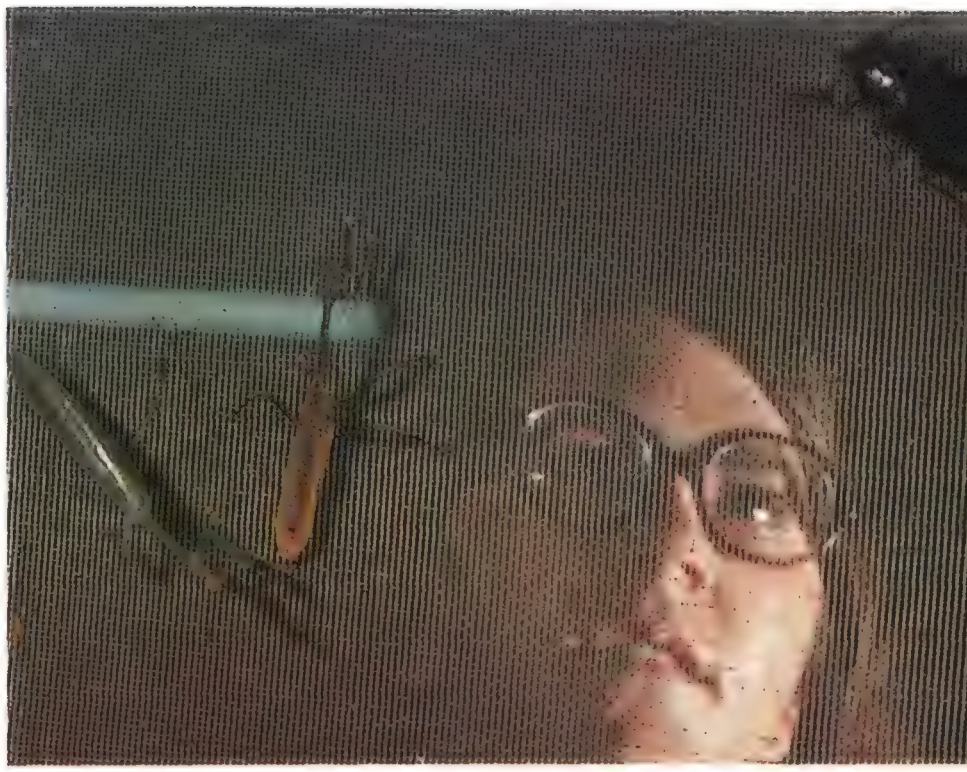
A jungle research outpost of the Smithsonian Institution, Barro Colorado is a 4,000-acre island rising from the waters of Gatun Lake in the Panama Canal Zone. Although the island lies just a few hundred yards from the channel through which great ships ply the canal, it could just as well be in the depths of the Amazon Basin. It is the home of tapirs, ocelots and coatimundis, of toucans, trogons and tinamous, of basilisk lizards that run on top of the water, and army ants which sweep the jungle in long deadly columns.

During this century much of the forest of the American tropics has been destroyed, and its creatures have been hunted into oblivion. But Barro Colorado remains a haven for 74 species of mammals, some 300 species of birds and nearly 2,000 kinds of flowering plants. On Barro Colorado a researcher can live in civilized comfort, yet step out the door into a rainforest wilderness where nature has been neither molested nor manhandled. There are dormitories and rooms for 30-odd visitors, a dining hall and a cluttered two-story laboratory. There is also a sign which commands: "No collecting." A sacrosanct ground rule of the island is that nothing may be killed or collected there—not a flower picked or a plant pressed or an insect pinned. Researchers who need to dissect or preserve specimens must do their collecting on the mainland. On Barro Colorado itself one may bring an animal into the lab for observation, as Russ would do with the snake, but within a matter of hours or days the creature would be returned, alive, to the jungle. There is only one exception to this rule: It *is* permitted to swat mosquitoes.

The jungle begins within a few feet of the laboratory. I'd already been in Central America long enough to know that, to the uninitiated, a walk in a tropical forest can be a confusing experience. The dense canopy overhead blocks out the sun. There are no orderly

Don Moser has written a book on Central American jungles to be published this year by Time-Life Books.

Dr. Michael May pursues dragonflies for use in his study of how temperature affects their activity.



Betsy Cooke inspects two mantises and a beetle attracted to a window screen by dining-room lights.

vistas of the Temperate Zone forests—just a green wall of foliage, a random confusion of trees and shrubs. For some people the first experience of the jungle can be frightening—one recent Barro Colorado visitor made it only a few hundred yards down the trail before he broke out in a sweat, declared he couldn't stand it anymore, and ran back to the laboratory clearing. But even the less timorous can be disoriented; until one learns what to look for, it is possible to walk for hours in the jungle without being aware of anything but billions of green leaves and the occasional cry of an unseen bird.

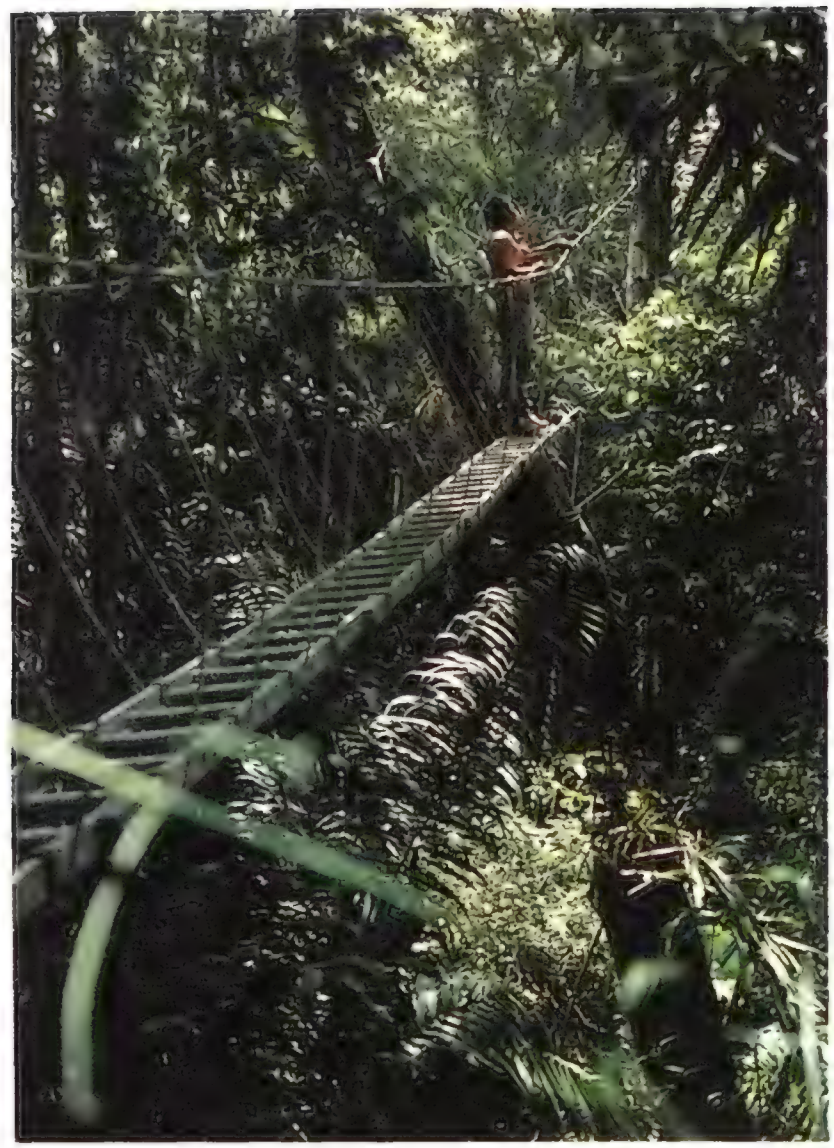
To get oriented myself, I went out for a walk with Dr. Nicholas Smythe, one of the Smithsonian's resident scientists. We left the laboratory clearing and wound down a narrow trail into the ravine of a creek. A few hundred feet into the forest we came to a small concrete shed. This was the environmental monitoring study site, Smythe said. Sensors on a tower projecting through the canopy were connected to recording instruments inside the shed. The sensors measured such factors as sunlight and rainfall, relative humidity and temperature. Some strange-looking devices of aluminum and plastic hanging from nearby trees were insect traps, intended to measure the abundance of insects in the forest.

The purpose of the study, Smythe explained, was to try to understand the importance of seasonal variations in the tropics. For in spite of the apparent fecundity of the tropical forests, there are periods during the year when plants put forth very little new growth, and there is very little food available for animals. "The lushness of the forest is a deception," he said. "The high productivity is the result of an extraordinarily delicate cycle that has evolved through eons of time. I wouldn't say that man will never be able to exploit this potentially high productivity for growing his own food but if he continues to use the present methods he will merely create enormous, bricklike deserts where the lush forests once stood. It is only by means of long-term studies like this one that we will be able to discover how natural forests function, and we have to know how they function before we can harness their productivity. The only problem is that by the time we begin to understand them, they will probably all have been cut down."

As we continued on along the steep muddy trail, Smythe helped me to see into the green wall. He pointed out a strangler fig which had totally enveloped and smothered its supporting tree and now stood alone, a massive contorted vine as thick as I am tall. Woody vines called lianas rose from the ground into the forest canopy where they ran from treetop to treetop for hundreds, even thousands, of feet—they were among the longest plants in the world, Smythe said. High in the branches of the trees were aerial gardens, great clumps of orchids and ferns and bromeliads which drew their nourishment from decaying leaves and nutrients washed along the branches by the rain.

Smythe found a beautiful green beetle, and a big black and red weevil; he poked his nose into a hollow tree and discovered a colony of scores of small moths, sociably sleeping away the day together.

Suddenly there was a loud whoosh over our heads,



Bridge leads to ladder that goes up a tree to top of canopy, from where picture at right was taken.

a spooky sound like an incoming mortar round. "What the devil was that?" I asked.

Smythe grinned. "A vulture," he said. "On a warm day they do display flights. They dive down over the jungle and pull up just above the canopy; when they pull out of the dive, their wings make that sound."

We saw no mammals during our walk, but Smythe described some that live on the island. There are collared peccaries, sharp-tusked jungle pigs which are formidable enough to rout a jaguar. There are 28 different kinds of bats, two species of tree-climbing anteaters, and howler monkeys which howl at anything intruding upon them, including low-flying airplanes. There are a few tapirs—long-snouted, leathery-skinned animals, distant relatives of horses.

Back at the station I went to the little library in the laboratory to try to learn something of Barro Colorado's history. Originally a rise of land on the banks of the Chagres River, Barro Colorado became an island in 1914 when Gatun Lake was filled to form a section of the Panama Canal. The island was declared a preserve by the Canal Zone Governor in 1923, and was administered by the National Research Council until 1946, when the Smithsonian took over.

From its very earliest days Barro Colorado attracted the luminaries of biological field research, and many of these men left their names behind on the island's trails and streams, so that today the Barro Colorado map is a kind of Who's Who of the great naturalists of the Twenties, Thirties and Forties. There are trails named for Frank E. Lutz, the entomologist whose field guide to insects has been a standard popular work for decades; for Thomas Barbour, the wealthy director of Harvard's Museum of Comparative Zoology, who used to commute to the island from his yacht moored offshore; for the zoologist William Morton Wheeler, the botanist David Fairchild and the ornithologist Frank M. Chapman. These men, and the hundreds of other scientists who have visited the island, have produced an entire library of scientific literature based on their observations there.

Barro Colorado has also generated some more popular literature. Chapman spent many seasons on the island during the Twenties and Thirties, and out of his experiences there he wrote two books: *My Tropical Air Castle* and *Life in an Air Castle*. Good-humored and full of enthusiasm for Barro Colorado, they still make charming reading, never more charming than when Chapman writes about his long friendship—and contest of wits—with a coatimundi named José.

A coati is a long-tailed, long-snouted animal the size of a small dog (p. 59), but with the jaws and teeth of a German shepherd. Coatis rather resemble streamlined raccoons, to which they are closely related. They are inquisitive, brazen and very intelligent. Just how intelligent Chapman revealed in his tale of what might be called the Barro Colorado banana war. Chapman started putting out bananas in a feeder to attract the local birds; soon a big male coati began coming in out of the jungle to help himself. Chapman admired the

Looking over the canopy, one can see a freighter passing through canal. In foreground, an insect trap.

animal and named him José, but decided that the banana raids must be foiled. He constructed a little aerial trolley between his cottage and a nearby tree, so that he could run a tray of bananas out along the trolley wire and leave it hanging in midair. José, unfazed, simply taught himself to do a tightrope walk along the wire, and soon was back among the bananas. Chapman then ran a string from the ground up and over a high wire, and suspended the banana tray from the other end of the string. José swaggered in from the jungle, examined this new device briefly, and then did exactly what a man would do—he took hold of the string where it was attached to the ground and reeled it in until the banana tray came over the wire and dropped to the ground. Over the following months Chapman rigged up ever-more-elaborate Rube Goldberg devices of wires and strings and poles and metal guard cones. But no matter how much ingenuity Chapman employed, José was able to solve the problem and get to the prize. Portly with bananas, José remained a regular resident of the station for several seasons until he came out on the short end of a duel over the affections of a female coati.

Although José has long since passed on to the great banana grove in the sky, coatis and other wild animals are part of the appeal of station life at Barro Colorado. After dinner, as you make your way from the dining hall to your quarters, you are apt to be held up at snout-point by a coati looking for a handout of food. In the daytime, spider monkeys swoop out of the jungle and onto the kitchen roof in search of goodies. Once I watched one of these big, aggressive monkeys open the screen door, whip into the kitchen, snatch a piece of toast off the table, and rocket back out again followed by a burst of Spanish invective from the cook. Leaving the dining hall one night, I jumped half out of my skin when I ran into what seemed to be a half-grown hippopotamus standing right outside the door. The hippo turned out to be a 400-pound tapir named Alice, who liked to drop in from the jungle to see if anyone had left her a few crusts of bread (p. 63).

The comparative ease with which one may see wild animals is, of course, a major ingredient in the island's attraction for researchers. Of all of Barro Colorado's creatures, the most popular subjects for animal watching are the howler monkeys. There may be as many

as 1,800 of these big, black, prehensile-tailed animals on the island, and for the serious monkey-watcher, the howlers possess an admirable trait: laziness.

The island's other big monkeys—the cebus and the hyperactive spiders—are constantly on the move through the forest canopy, leaving human observers floundering through the brush below. But the howlers, like cows chewing their cud, spend a lot of time just lying around letting their food digest.

One evening I went out hunting for howlers with Frank Mendel, a young graduate student from the University of California at Davis. Not far down the trail, Frank stopped and clapped his hands loudly, twice. That is a standard signal on the island, meaning roughly: "Any other monkey-watchers around here?" After a moment there came an answering clap from up ahead, and Steve and Cindy Gaulin of Harvard came swinging down the trail. They explained that they'd had a howler troop under observation until it moved off just a few minutes before, and now they were trying to catch up. Steve and Cindy left the trail and started pushing their way through the thick undergrowth, and Frank and I followed. A few minutes later, as I was trying to extricate myself from an infernal tangle of vines, the jungle exploded with a noise so loud and fearsome that it sounded like an announcement of the end of the world. We'd found the troop.

After moving forward a few more yards we spotted the monkeys, a dozen dark shapes high in the trees. Out came binoculars, notebooks, tape recorders and stopwatches, and Fred and the Gaulins settled down to serious monkey-watching. All of them were using what is called "focal-animal technique," a method of field observation which would try the patience of Job. With focal-animal technique the researcher picks an animal at random and closely observes its every action —or lack of action—for a predetermined period of time. Other monkeys in the troop may fight, copulate, play or carry on in other interesting ways, but if the focal animal decides to take a nap the observer must ignore all the other activity and stand there, neck craned back, binoculars locked to eyeballs, and watch his focal animal snooze.

Tonight, though, the monkeys were quite active. They moved around in the trees above us, the males occasionally loosing a cannonade of roars in our direction. Eyes glued on the animal he'd chosen, Frank started talking into the recorder mike he had taped to his binoculars: "It is five o'clock," he said. "I have a juvenile, seated, resting on a medium-sized branch, upper third, proximal third." A bit later he said, "Thirty-five seconds into quarter, the animal leaps, now hanging by an arm from the branch, small size, now over on negatively inclined small branches—woops, lost the bastard!" Frank dropped his binoculars and plunged into the underbrush in hot pursuit of his monkey.

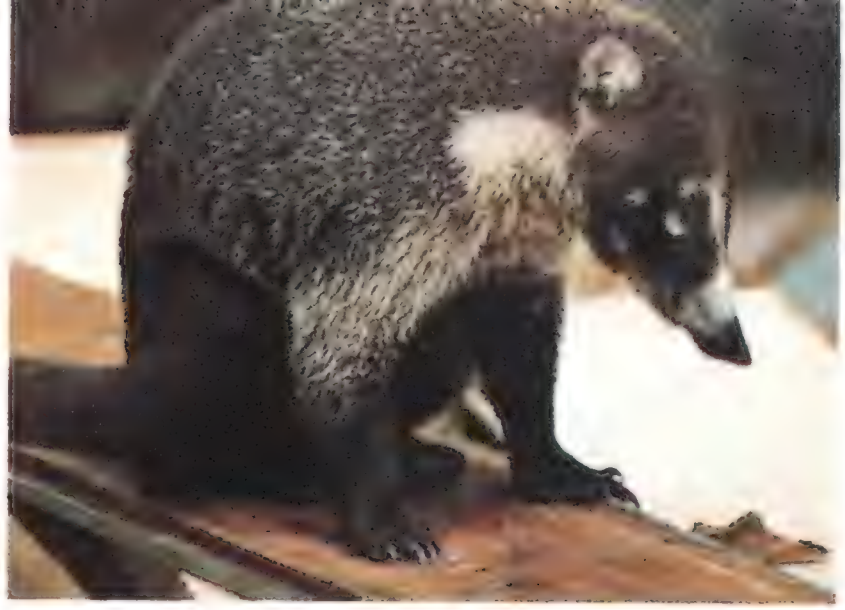
I moved over next to Steve and Cindy Gaulin. Directly above us a big male howler peered belligerently down from the canopy. I'd already learned that there were certain hazards involved in getting right under a howler. I assumed that this was a tall tale concocted

Spider monkeys cavort on the dormitory roof.
They sometimes make commando raids on the kitchen.

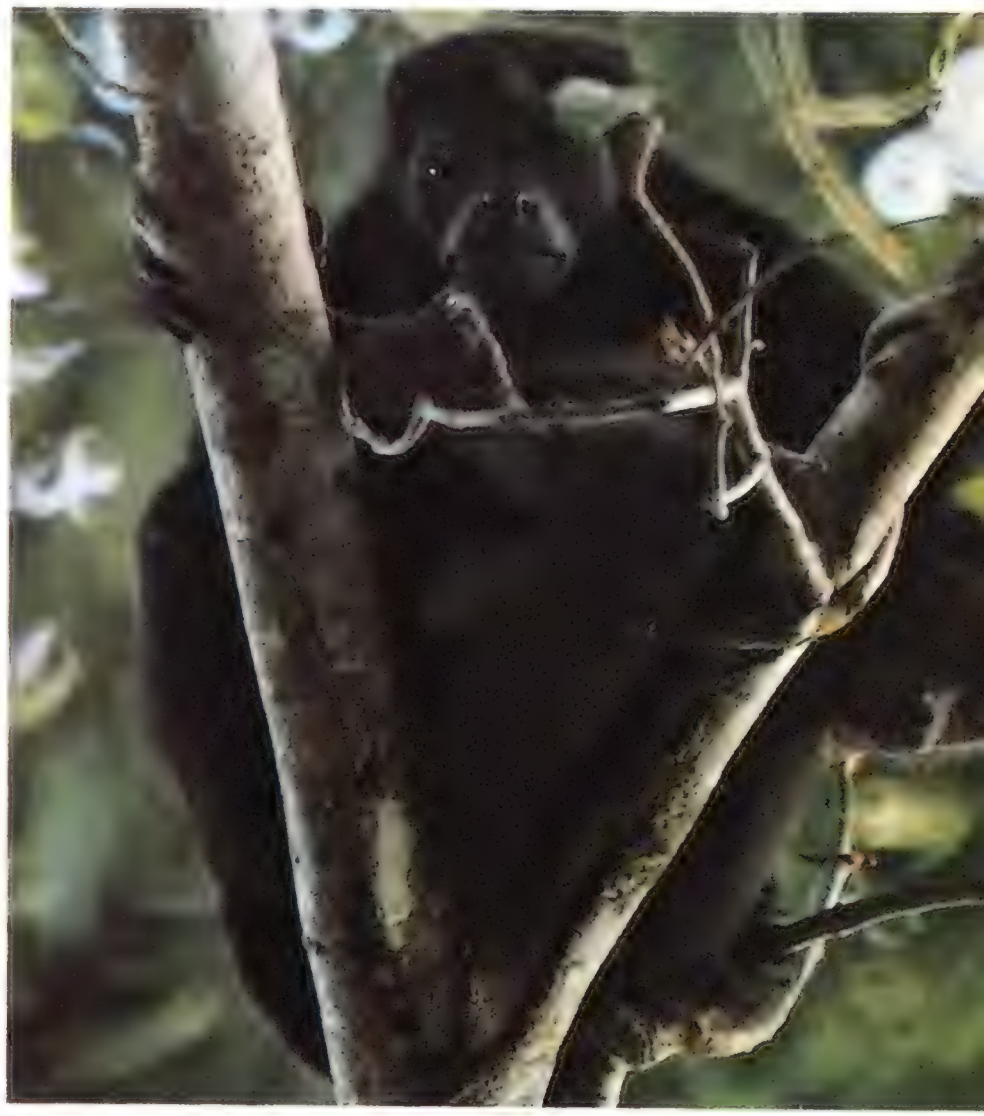
especially for newcomers. But on my second day at Barro Colorado, a howler in a tree over the trail—after calculating target speed and windage with the accuracy of a bombardier—plopped an entire load of feces right on the head of the person walking in front of me. Later that same day, from high in a tree, a lone male howler did his best to urinate on us.

I discreetly moved a couple of feet behind Steve and Cindy. Steve was watching one of the monkeys through his binoculars; he relayed information to Cindy, who transcribed it into a notebook in a kind of code. One entry read: ES 1 :15 4. Cindy translated for me: The monkey was eating, in a sitting position. He ate one leaf, and spent 15 seconds doing it. And the tree he was dining on, with the code number 4, was called *Poulsenia*. The next entry read: L→1 ↑ 1, which meant that the monkey moved ("locomoted" in the biologists' jargon) across one meter and up one meter.

Although it was growing dark in the jungle, and the mosquitoes were getting fierce, nobody made any move to start back to the station, for the observation period was not yet up. It might seem that the Gaulins' dedication to observing the monkeys' apparently trivial behavior was an example of science being carried to some lunatic extreme. But Frank, Steve and Cindy



Coatis, closely related to the raccoon, often appear in the evening to beg handouts of passersby.



Howler and baby: Unwittingly these monkeys have heavily contributed to knowledge of primate behavior.

Large black scorpions like this forage at night; by day they hide themselves in dark crevices.

Visiting college students stride along a forest path; 30 or more visitors may be on the island at once.

were all working on problems of significance. Steve and Cindy were trying to work out the monkeys' energy budget—that is, how much work did the monkeys expend in obtaining certain kinds of food, and how did they make choices about what to eat? This information, the Gaulins hoped, would shed some light on how resources were divided up by the jungle creatures, and how species fit themselves into different ecological niches. Frank, meanwhile, was trying to learn precisely how the howlers moved through the jungle—under what circumstances they jumped, or used their tails for support, or climbed upside down rather than right side up. He hoped that he would thus learn something about how specialized anatomy develops in relation to an animal's environment.

At the time I was on the island, some two dozen researchers were working on similar problems, ranging from studies of the maternal behavior of agoutis—leggy rabbitlike animals of the jungle floor—to the effects of temperature on the activities of damselflies. The researchers went out in the forest every day to practice science, and came back at night to talk science in the dining hall and the laboratory. They were obviously enjoying themselves enormously, in spite of the fact that life on Barro is not without discomforts. It is hot, and the humidity in the forest normally ranged from 95 to 100 percent. The humidity is hard on both people and scientific instruments. "During the height of the rainy season," said Dr. Smythe, "fungus grows on everything, including you. Some of it even lives on the chemical coating of optical lenses, and your binoculars start growing flowers inside them."

And then, of course, there are the bugs. When the insects take over the world, it will undoubtedly be from Barro Colorado, where they already have a good head start. The island is acrawl with cicadas the size of house sparrows, beetles which could carry off your dinner plate, and morpho butterflies with iridescent blue wings so vivid that pilots have reported seeing them from thousands of feet in the air. Aside from these relatively benign insects, there is an army of wasps, bees, flies, mosquitoes and ants. The most fearsome of these insects are inch-long *Paraponera* ants, which both bite and sting with such potency as to make a grown man ill. Even the jungle-hardened biologists of Barro Colorado treat the *Paraponera* with as much respect as they would cobras.

The scientists, in fact, not only cheerfully put up with discomforts but with genuine hazards, as I learned one morning when Bonifacio de León, a research assistant, walked into the dining hall and announced that he'd found a lazy. "Perezoso," he said excitedly, "perezoso." A lazy is what a Panameño calls a sloth, and although there are thousands of sloths on Barro Colorado, they are so difficult to see in the forest canopy that the discovery of one always generates a flurry of activity. Dr. Gene Montgomery of the National Zoo has been studying them for some time, trying to understand their diet—three-toed sloths don't eat properly in captivity and eventually starve to death—and trying also to determine whether they may be vectors of yel-

The black-breasted puffbird will perch for long periods of time waiting for prey to appear.

A baby caiman is studied briefly before being released; no animals or plants are kept.

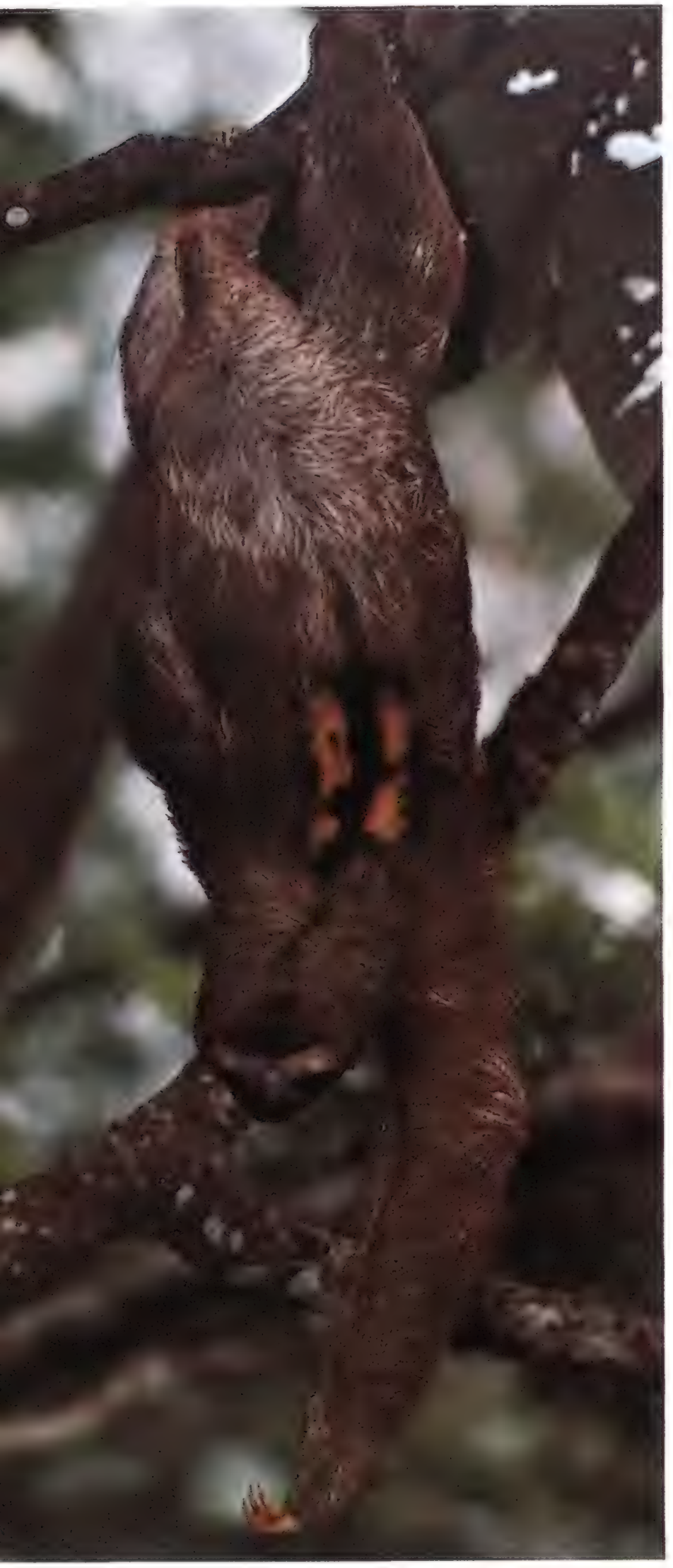
low fever. On this particular morning Montgomery was off the island, and two of his colleagues—Mitch Bush, a veterinarian from the National Zoo, and Jeff Waage, a student at Princeton—decided to capture the animal so it could be tagged and measured.

Bonifacio led us to the edge of the station clearing, pointed to the top of a tree growing up from a steep gully below us, and pronounced, "Perezoso." I scanned the tree with binoculars, and sure enough, there was the lazy. Oliver Goldsmith once called the sloth "the most ill-formed of all those animals that chew the cud," and the naturalist Buffon wrote: "One more defect and it would cease to survive." Indeed, the creature looked less like an animal than a blob of brown moss.

The sloth was about 50 feet up; the tree was very thin. It all looked quite impossible to me, but after a little joshing over who would have the privilege of ascending the tree, Jeff strapped himself into a pair of lineman's climbers and started up, chopping his spikes into the bark. When he was ten feet above us his spikes slipped and he clutched himself to the trunk. "These spikes aren't holding too well," he said, his face a tight grin.

"You've got to get your knees out," Mitch said, and

Occasionally a bat will land in the lab clearing and need a little help to get airborne again.



A three-toed sloth hangs by its feet. They are common on the island, but are hard to see. This rare photograph was taken by Dr. Smythe.

then he looked at me and winked. "This is only Jeff's second tree."

Jeff managed to get his spikes dug in, and moved up a little farther. Suddenly he began slapping at his hair. "Bees," he said. He kept his spikes dug into the tree while the top half of his body did a little St. Vitus dance. "Damn bees," he gasped, and started climbing quickly. Now he had to force his way through some branches of adjacent understory trees and his position looked very precarious. "These branches are really giving me grief," he called down.

Perhaps Jeff hoped Mitch would suggest he forget the sloth and climb back down. But apprentice sloth-catchers can't count on much sympathy on Barro Colorado. Mitch just laughed and said, "Don't worry, the branches will give you a soft canopy to land on if you fall."

Jeff was out of sight now, but the trunk of the tree was swaying back and forth.

A few minutes later Jeff came into sight again, perched 50 feet up in the tree, almost at the level of the sloth. He lowered a rope, and Mitch sent up to him a long aluminum pole with a wire noose on the end. By now the lazy had become aroused—or as aroused as a sloth ever gets. In its somnambulistic way it moved farther out the branch it was on. When Jeff tried the noose, the animal ducked its head. For the next ten minutes Jeff sweated, swore and struggled till I feared he was going to fall out of the tree.

But he finally got the noose over one of the sloth's legs and then lowered the animal to the ground. He climbed back down more quickly than he'd ascended, and finally stood beside us on the ground, trembling a little from the exertion. Mitch picked up the sloth by what you would have to call its elbows, and held it out for us to see.

The sloth's neck tapered into a small reptilian head. It had little piggy eyes and no nose worth mentioning. Looking at us, it turned its head slowly, as if in a trance. I recalled that someone had described the sloth as looking like "the infant offspring of a sea turtle and an idiot rag doll," and the description seemed apt.

Mitch held the sloth so that he could look at it eye to eye. "Isn't it adorable?" he asked.

Jeff Waage had just risked limb, if not life, to capture a creature that would be convicted by any impartial jury of being the homeliest animal ever invented. But now Jeff showed he had the stuff Barro Colorado scientists are made of. He grinned "Yeah," he said.

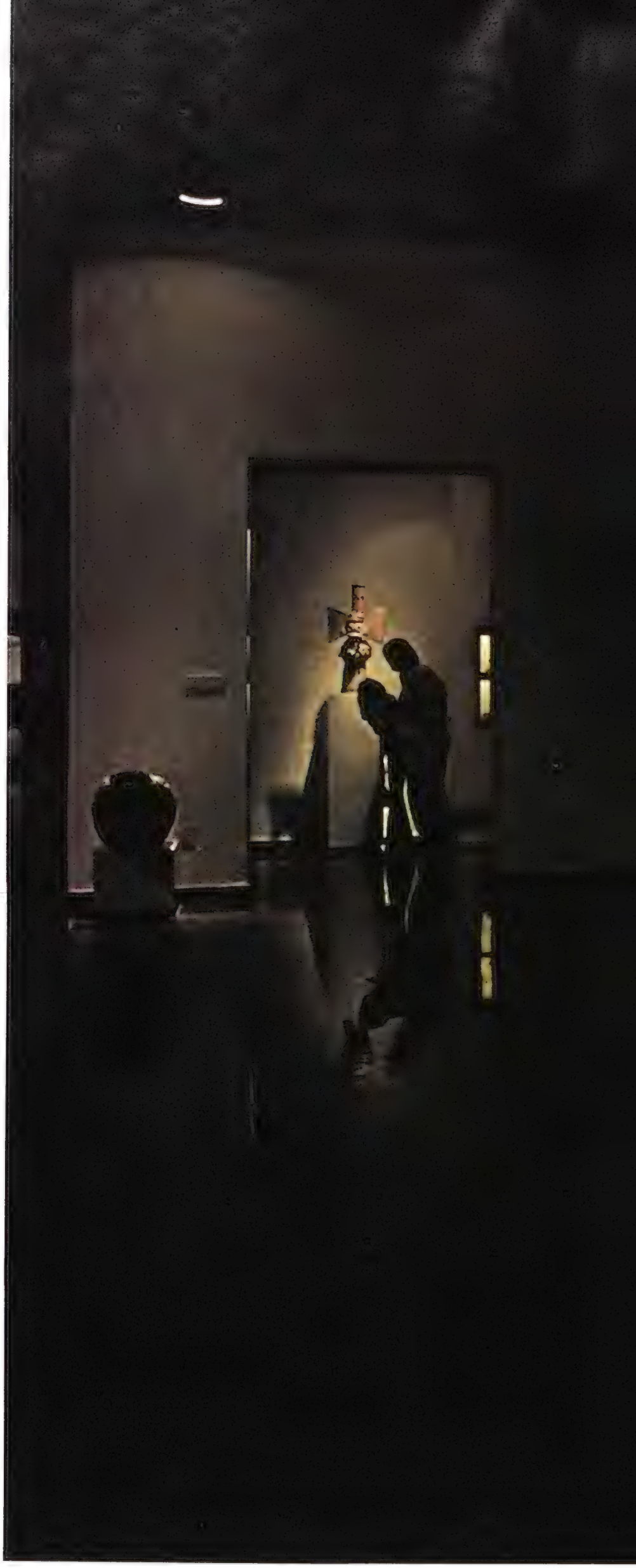
A kitchen worker shoos Alice, the 400-pound tapir, back to the forest. Food is seasonally scarce in the forest and tapirs sometimes invade the kitchen.

Rufino Tamayo, a contemporary artist with a lifelong devotion to the arts of his country's past.

To Mexico with pride: a museum of pre-Hispanic art

One of North America's—and the world's—eminent artists, the painter Tamayo, has made a remarkable gift to his country

Text begins on page 66



Five color-keyed rooms (as on the Tamayo palette) make up the museum. The collection contains

1,000 choice examples of pre-Hispanic art ranging from 1250 B.C. to A.D. 1521. This is the green room.

Photographs by Yale Joel

By William Weber Johnson

The vibrant, painted world of Rufino Tamayo is a place of polarities and contradictions. Radiance and gloom. Flames and cinders. Flowers and stones. Joy and terror. Soaring birds and howling beasts. Guitars and silent music. Clocks without hands or numbers in a timeless world.

The outer world of Rufino Tamayo is more ordered, less fanciful, more consistent. Tamayo loves the realities of the great cities that he has called home—New York, Paris and particularly Mexico City, where he leads a well-regulated life in a house that he carefully designed himself.

Oaxaca de Juarez, the city in southern Mexico where Tamayo was born 76 years ago, is also close to his heart and perhaps even nearer to reality: Zapotec and Mixtec faces, gilded churches filled with figures of suffering saints, Indian markets with pyramids of fruit and mounds of flowers; and an old, laurel-shaded plaza where, in the evening, a uniformed band plays marches by Sousa, waltzes by Strauss and lilting Mexican songs of love and trouble.

When Tamayo left Oaxaca 66 years ago, he was known as a diligent acolyte with a sweet singing voice who sometimes led the choir at the church of San Felipe; for singing the entire Rosary he was paid the equivalent of six cents. His parents died and the boy, then ten, went quietly off to live with an aunt in Mexico City.

Now, when Tamayo returns to Oaxaca, he is greeted everywhere with gravity and deference. For he is *el maestro,* one of Mexico's most famous living painters, internationally renowned, and highly recompensed. In the cultural world he is Oaxaca's most illustrious son. More: He is also a generous benefactor of his native city. Just a few squares away from the San Felipe church stands the Rufino Tamayo Museum of Pre-Hispanic Mexican Art, a gift from the Tamayos to their native city and state. It is a handsome old colonial building built of gray-green Oaxaca stone. In the 17th century it was the local headquarters of a Spanish chivalric order. Later it housed the archives of Oaxaca. Then for many years it was a tumbledown ruin. When Tamayo told local officials what he had in mind, they gave him the ruin to do with as he liked.

Workmen, paid and directed by Tamayo in person, put it back together: stone pillars supporting a beamed roof over the terrace, five stately rooms opening off the terrace, a flower-filled patio with a fountain. Finally, he shipped in a collection of approximately 1,000 choice examples of pre-Hispanic sculpture, pottery and fresco. He has had a lifelong interest in these ancient art objects. As a child he used to pick up Zapotec and Mixtec artifacts in the countryside. As a young man heading the department of ethnographic drawing at the old National Museum of Archaeology on Moneda Street, he became intimately acquainted with the other great cultures of ancient Mexico. He has been specifically collecting for the Tamayo museum for the past 15 years, buying the best that dealers and other collectors had to offer. The National Institute of Fine Arts has estimated the value of the museum and collection at $1 million. But the monetary value of the gift was the farthest thing from Tamayo's mind. What he wanted was to present an esthetic gift to Oaxaca, a gift in keeping with his own artistic sense and the rich archaeological past of Mexico.

The result is one of the most remarkable collections

Smiling child, classic period (A.D. 200-750), central Veracruz, has characteristic cranial deformation.

Tamayo's work doesn't copy the past, but "feel" of *Hombre Radianto de Algria* is similar to child's gestures.

The author, now a free-lance writer at work on his 11th book, four of them on Mexico, was a foreign correspondent for Time *and* Life

of pre-Hispanic art in the world. Unlike the magnificent National Museum of Anthropology in Mexico City, which can be almost overwhelming in its extent and comprehensiveness, the Tamayo museum is personal and intimate. A visit to it is more a rich, emotional experience than it is a stupefying venture into Mexico's multifaceted artistic past.

Tamayo personally chose each piece solely on esthetic grounds, judged on the extent to which it illustrated the sensibility and versatility of the cultures that existed in Mexico for almost 3,000 years. Olmec, Mayan, Totonac, Teotihuacán, Toltec, Tarascan, Zapotec, Mixtec, Aztec and other cultures are represented, some related, some startlingly different. There was no effort to present a complete geographic and cultural cross section of the past, or to provide a complete sequential chronology. The collection falls roughly into four periods: preclassic, from 1250 B.C. to A.D. 200; classic, from 200 to 750; late classic, from 750 to 950; and the period beginning in 1100 and ending with the completion of the Spanish conquest, 1521. But the arrangement in the museum is not so much governed by epochs as it is by affinities and contrasts between cultures of roughly the same time periods.

The pieces of ceramic and carved stone—idols, figurines, pots, stelae and frescoes—are displayed in the five high-ceilinged rooms, some standing free, some on pedestals, some in glass-fronted niches in the thick walls. Some of the colors on pots and frescoes are still bright and clear—orange, terra-cotta, umber, black

and white. The clay and stone faces smile, grin mirthlessly, scowl or display exaltation, serenity or terror. The figures, some in ornate costumes, some graphically nude, are proud, abject, playful, menacing, fearful, exuberant—subject to realities and visions of a world at which the viewer can only guess.

The ceilings and niches of the exhibition rooms are in Tamayo-like tones: the first room is rose, the second blue, then violet, orange and green. The colors, reflected from the white walls and the polished gray marble floors, make the rooms glow in a soft light.

Tamayo, at 76, seems ageless. His hair is snowy white but his skin is firm, unwrinkled. His back is erect, his air dignified. His long-fingered hands are still deft and steady. His manner is staid. "What I have to say," he will tell you, "I say better with my paintings than I do with words."

He works steadily at his painting. By ten each morning he is at his heavy-duty easel. His studio is a large, plain second-floor room in the Tamayos' colonial house in San Angel, one of the oldest and loveliest sections of Mexico City. Finished canvases are stacked along one wall. A wooden table holds paints and the marble powder he uses for texture. Tent canvas stretched on the floor catches spatters. Everything is orderly and neat, as is Tamayo himself. He wears dark trousers, a shirt, usually with a necktie, and a gray cardigan sweater if it is cool. He usually paints steadily until light fails in the afternoon. He is constantly producing for scheduled future exhibitions in the United States, Europe, the Orient and Mexico.

Occasionally, however, Tamayo will interrupt his work to show a visitor through the house. There is still a small collection of 20-odd pre-Hispanic pieces that the Tamayos have kept for themselves. Most of them are arranged in indigo-painted shadow boxes on the stairway landing. There is also a collection of Mexican folk art—colorful decorations, utensils, ritualistic and ceremonial symbols, textiles, toys and games.

The artist, his wife Olga and their dogs, at home. The house itself is a museum, an

There are also Tamayo paintings, including a number of small early ones that Olga Tamayo has been buying back whenever possible, occasionally at 200 times the price for which Tamayo originally sold them. There is a larger-than-life, full-length portrait of Olga, draped in orange, in the living room. And in the dining room there is a large painting of watermelons—for many years a sort of Tamayo trademark.

When Tamayo came to Mexico City as a youngster he lived and worked with an aunt who imported fruit from the tropical lowlands and sold it in the old Merced market. The aunt hoped Tamayo would become a bookkeeper and enrolled him in a commercial school. But in addition to the commercial school, Tamayo attended night classes at the School of Fine

intimate and personal collection of early Mexican art, select Tamayos, and grand portrait of Olga.

Arts, then went full-time to the San Carlos Academy, cultivating an interest he had always had in drawing and painting. He also learned to play the guitar. Although he soon became disillusioned with the rigid, unimaginative instruction at his art school, painting won out over bookkeeping and music.

By 1926 Tamayo had enough paintings to mount an exhibition of his own work in an Avenida Madero storefront that had been a gun shop during the recently ended revolution. With the little money he made, he packed up the exhibition and took it to New York. Some of his work was shown at the Weyhe Gallery. There was favorable critical comment, but few sales. Tamayo was near starvation, often having to get by on an apple a day. He shared rented rooms, first on 13th Street, later on 14th, with Carlos Chávez, who was to become Mexico's most famous composer and conductor. Chávez was trying, unsuccessfully, to become a jazz musician and had even composed what he thought was a fox-trot. Times were hard for both of them. Tamayo became ill and his friend Miguel Covarrubias, the writer and illustrator who was prospering as a caricaturist for *Vanity Fair*, paid his way back to Mexico.

Tamayo would work in Mexico until he had put some money aside, return to New York, paint furiously until his money was gone, then go back to Mexico. Finally, he was hired as an art teacher by the Dalton School, a progressive private school in New York. Most of the students and some of the faculty called him Mr. Tomato. Still, teaching enabled him to stay in New York, and he was painting steadily. An exhibition of his gouaches at the Julien Levy Gallery attracted the attention of Valentine Dudensing, who offered him an exhibition at his Valentine Gallery. The first show at Valentine in 1939 brought few sales. Disappointed, Tamayo urged Dudensing to stop wasting time, effort and gallery space. Dudensing said that Tamayo should concern himself only with painting and leave everything else to him. It was the sort of expression of faith the painter needed. It came at a time when Tamayo, after much experimentation, had developed a mature style that was unmistakeably his own. The exhibitions in the Valentine Gallery from that time on had much to do with establishing Tamayo as both a widely recognized and highly salable artist.

Not an Old Boy

By this time Tamayo was married. When they could afford it, the Tamayos spent the summers in Mexico, the winters in New York. By the mid-1940s Tamayo had an international reputation, but his position in the hierarchy of Mexican painting was a matter of some disagreement. He had come of age in the so-called "Mexican Renaissance," an era dominated by the three great muralists, José Clemente Orozco, Diego Rivera and David Alfaro Siqueiros. Tamayo had done murals more or less in the accepted style. He was for a time a close friend and collaborator of Rivera, and his work owed certain debts to Orozco. Still, he did not qualify as an Old Boy in the monumental, revolutionary school. There was a certain irony in this. The Big Three concerned themselves with Mexico's poor and downtrodden, with the Indian masses and their oppressors, with the glories and horrors of Mexico's struggle for nationhood. Tamayo came from a more genuinely humble background than any of them, he was more certifiably Indian, and while too young to be a combatant, he had seen at least as much of the Mexican Revolution as had the others. Nevertheless he was regarded as an outsider, a black sheep, even anti-

Ceramic scenes like this one were artfully wrought in Nayarit long ago; preclassic (1250 B.C.-A.D. 200)

Mexican. He was not didactic. He was not hortatory. He had no commitment to history, allegory, political causes or propaganda. He frequently dealt with horrors, but they were horrors of a universal sort rather than the specific horrors of a suffering Mexican proletariat. While he was a skilled muralist, he did not regard a paintable wall as a political podium. He was happier and more productive working at an easel, "where I am in complete control instead of having to make my painting conform to conditions imposed from without." And while Rivera and Siqueiros were astonishingly articulate—pamphlets, speeches, torrents of argument—Tamayo, for the most part, maintained an Indianlike silence.

Tamayo has little interest in political, intellectual or philosophical matters. He loves his native country, its heritage, its artistic traditions, its colors and rhythms, and he has been shaped by all of them. But for him painting is not so much a matter of intellect as it is of the senses, of feeling—and these are not restricted by national boundaries.

"Subject matter is not my primary concern," he has said. "In my paintings subject matter practically does not exist. I am against drawing attention to the subject because in that case the painting becomes the illustration of an idea or subject." If his subjects could be reduced to words they probably would hold little interest for him.

His growth as a painter has meant limiting his palette, simplifying and restricting forms, trying, as he says, "to express the essence of things." He is more interested in the structure of the human figure as a whole than he is in its parts. Still, he says, "art must have a human quality. There has to be a point of convergence between what the painter paints and what the observer sees or feels. There has to be a message."

But wasn't the "message," or the lack of it, one of his differences with the great muralists of Mexico?

"No. There has to be a message. But with me it is a plastic message. Not literary. Not philosophical. If the painter is successful, his work must bring a response from the viewer. It may affect him in the mind, the heart. He may feel as if he had been hit in the stomach. He may say 'I don't understand it but I like the color.' That is a humanistic message. It should not be confused with demagogy."

One of Tamayo's difficulties as a young painter in Mexico was the virtual impossibility of finding out, through exhibitions, books or magazines, what was going on elsewhere in the art world. Remembering this, he has begun plans for a second museum that he hopes to give to his country, and has begun buying paintings for it. It will be a museum of contemporary art. Not just Mexican contemporary, which Mexico already has in its fine Museum of Modern Arts, but contemporary work from all parts of the world.

Mexico's president, Luís Echeverría Alvarez, is interested and has promised help. And Tamayo hopes that he may also be able to get support from philanthropists or from international trade organizations. One way or another he intends to get it done in the hope of providing young painters—and laymen—the kind of enlightenment that was missing from his own youth. It was a shortcoming that he was to remedy during his life in New York and, beginning in 1949, the various trips to Europe. He was particularly aware of El Greco and Tintoretto ("the first modern painters"), Matisse, Braque and Picasso, and he readily acknowledges that all of them have influenced him: "Of course, because I am a contemporary." But, he adds thoughtfully, "With or without them the result would be the same. My paintings would be different, but I would still be a painter."

On the other hand, he might not have been the painter he is or even a painter at all had it not been for his Mexican roots, roots firmly planted in the tradition of Mexico's old pre-Hispanic arts and nourished by the rich colors and inventiveness of Mexico's folk art. This is a debt for which the Tamayo pre-Hispanic museum in Oaxaca is partial payment.

"Everything I have," Tamayo says, "I want to give back to my country."

A seated figure that is possibly a priest of the deity Tlazolteotl, dating from the late classical period.

Othniel Charles Marsh, when accused of plagiarism and other abuses by his paleontological rival, Edward Drinker Cope (opposite), retaliated in kind.

In this Charles R. Knight painting, two of Cope's dinosaurs, *Dryptosaurus*, are battling with ferocity characteristic of the two "famous haters."

By Caroline E. Werkley

Professor Cope, not alive but well

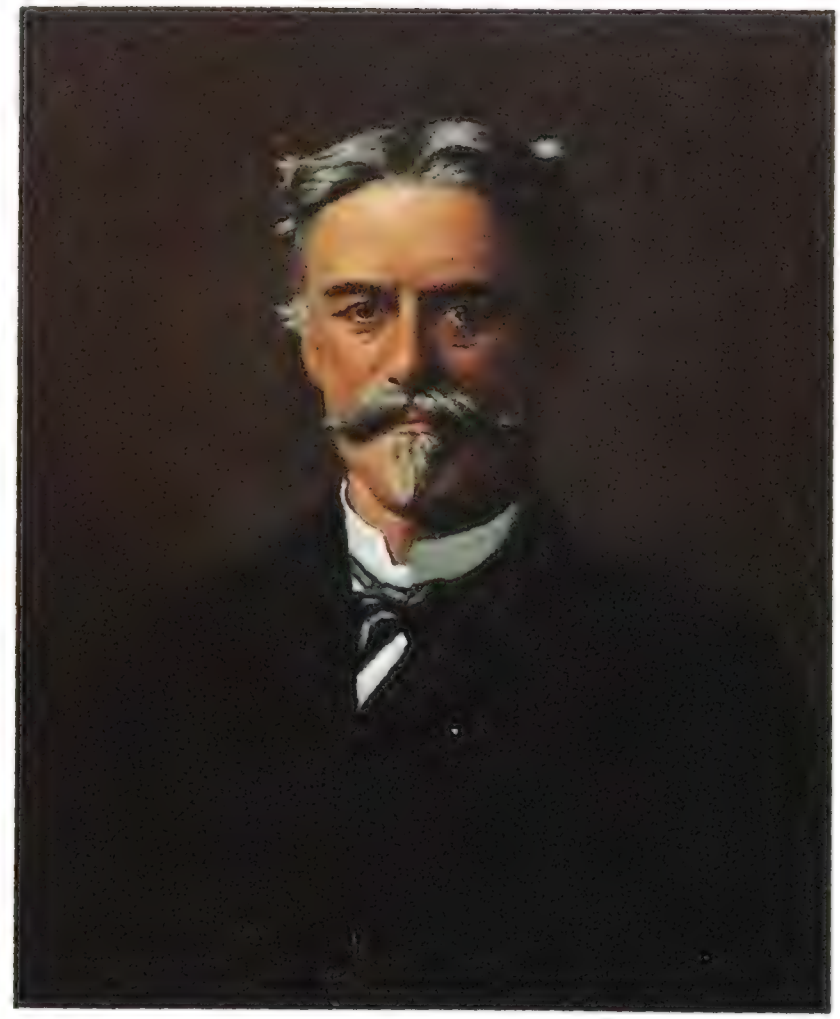
After the paleontology wars of the 19th century, and after a period of being "lost," a noted scientist rests in relative peace

Caroline Werkley, author of Mister Carnegie's Lib'ary, *works with Dr. Loren Eiseley at the University of Pennsylvania and considers herself a friend of Cope.*

Skeleton No. 4989, the earthly remains of one of the leading vertebrate paleontologists in the United States in the last three decades of the 19th century, is doubtless provoked that he must share, as a house guest, what is otherwise a most attractive office in the Department of Anthropology at the University of Pennsylvania in Philadelphia, with the scientific publications of his onetime, longtime enemy, another of the important paleontologists of the same period.

Eighty-six years after accusing Professor Othniel Charles Marsh of allowing his assistants to write his well-known *Dinocerata* ("the last chapter in that book, containing the general conclusions was plagiarized from myself. . . ."), Edward Drinker Cope now resides within staring distance of not only one but *two* presentation copies of the offending *Dinocerata*, a ten-pound mammoth quarto that is itself something of a dinosaur in the world of books. The presence of these two volumes, part of the 500-copy privately printed author's edition with the title page dated 1884, was never intended as an insult to Professor Cope by their owner, Loren Eiseley, who is Professor Cope's host, and who is also Benjamin Franklin Professor of Anthropology and the History of Science at the university. They are merely part of his own personal library.

Courtesy of the American Museum of Natural History



One of the 19th century's great hunters of dinosaurs, Professor Cope of Philadelphia, considered Yale's Marsh to be insane; Marsh thought the same of Cope.

As a result of Cope's desire to leave his body unburied at the time of his death in 1897, his skeleton, after an unexplainable "lost" period, is now safely arranged in a cardboard carton labeled unsentimentally with his name and museum catalog number.

"I direct that after my funeral my body shall be presented to the Anthropometric Society and that an autopsy shall be performed on it," read Cope's will, dated March 24, 1896. "My brain shall be preserved in their collection of brains, and my skeleton shall be prepared and preserved in their collection, in a locked case or drawer, and shall not be placed on exhibition, but shall be open to the inspection of students of anthropology. The remainder of my body, I direct, shall be burned and my ashes be preserved in the same place as shall contain the ashes of my esteemed friends, Dr. Jos. Leidy and Dr. Jno. A. Ryder."

Edward Drinker Cope's brain and skull were still in the possession of the Anthropometric Society in 1902-03, when Dr. Edward Anthony Spitzka, Professor of General Anatomy at Jefferson Medical College in Philadelphia, had them at his disposal and studied them carefully. A paper written by Dr. Spitzka concerning the brain and Professor Cope's skull was published in 1907 in the *Transactions of the American Philosophical Society*. Spitzka noted that the Anthropometric Society had had a collection of brains of eight well-known persons, including that of Joseph Leidy, the father of American vertebrate paleontology, and that of Cope. The brain of Walt Whitman *had* been in the collection, but the jar in which it was placed was said to have been dropped on the floor by a careless assistant and nothing was saved from this disaster. Fortunately, the brain of Cope at this time was reported by Spitzka to be in "excellent condition."

As for the skull, it was "in fairly good condition. The calva has been separated by a sawcut, and a portion of the parietal bone in the left temporal fossa is missing," Spitzka wrote. "The specimen is remarkable on account of the proportionately large size of the cranium as compared with the face, in this respect approaching the notable skull of Kant."

Did Spitzka ever return the skeleton to the locked drawer, one wonders? All that is known at the university museum is that it arrived there in 1966 with a group of primate material which had been offered by Wistar Institute of Anatomy and Biology to the university's Department of Anthropology. An anthropologist who helped deliver the material to his department noted the well-known name of Edward Drinker

Professor Cope, not alive but well

Cope on a carton of bones and deposited it carefully in the anthropology laboratory in the museum. Word of Professor Cope's arrival in the museum soon reached Professor Eiseley, who has written: "Now as it happens I am fortunate. I practice a trade which enables me to keep these objects about in a perfectly logical and open manner. I have not murdered to possess them, and if one or two were acquired in dark and musty places, my motives . . . are beyond reproach."

His motives were indeed beyond reproach when he brought the eminent newcomer to his own office, leaving a note which read "Gone to lunch—Edward Drinker Cope" in the anthropology laboratory where the carton containing Cope's bones had been placed. True, Cope had said that anthropology students could study him, but he did not say that he should be left sitting on a shelf where anyone could wander in and out and pick up a souvenir of him.

At the time Cope moved in with Professor Eiseley, his skull, with its portion of parietal bone still missing, was tumbled at the bottom of the carton. Professor Eiseley removed the bones gently and respectfully from the dust-covered box and laid them out on his long conference table to be sure that all of Professor Cope's skeleton was there. Then, believing that the former paleontologist, who himself had stored many a bone in a carton, would probably feel more at home in the box, returned him to it, with his skull balanced properly on top, as it should be.

In their lifetimes, both Cope and Marsh were clever and ambitious. Both wanted to come in first, and neither was too particular where fossil collecting was concerned. The history of paleontological science in the United States during the active working years of these two "famous haters" was studded with almost as many accusatory words as it was with the discoveries of the fossils of extinct native American fauna. Their competitiveness spurred both men to discover (or have discovered for them), name, and publish accounts of their finds, which were christened with such non-American names as *Camarasaurus supremus,* Cope, and *Stegosaurus ungulatus,* Marsh. A typical account of who got the best and the biggest, according to which scientist wrote the story, is seen in Cope's report of the fossils of some leather-winged flying reptiles, or Kansas dragons, that had glided clumsily over the American Mediterranean sea millions of years ago. "One of them *(Pterodactylus occidentalis,* Marsh) spread eighteen feet between the tips of its wings, while the *P. umbrosus,* Cope, covered nearly twenty-five feet with his expanses. . . ." Marsh's reaction to this must have been unrepeatable, since, even if *umbrosus* was bigger than *occidentalis,* it was he who is credited with discovering the first bone of a giant pterodactyl in North America in 1870 and publishing its description.

The intimation of the existence of insanity in each other (Cope, of Marsh: "I suspect that a Hospital will yet receive him"; Marsh, of Cope: ". . . I had some doubts of his sanity") were mild in comparison to other epithets that these not-so-gentle men heaped upon each other. When one views Charles R. Knight's painting in the collection of the American Museum of Natural History of a battle between two sharp-toothed and clawed carnivorous dinosaurs, *Dryptosaurus (Laelaps aquilunguis),* discovered in New Jersey and later in Montana by Cope and named by him, one is reminded of the hatred, expressed in our more polite society by words, between Cope and Marsh. Nevertheless, in spite of arguments as to who found what first or who stole the glory from whom, the Peabody Museum of Natural History at Yale, the American Museum of Natural History in New York and the Smithsonian's National Museum of Natural History in Washington are the fortunate beneficiaries of the bone-hunting squabbles.

Dried flowers and a little sherry

It has been almost ten years now since Professor Cope came to lunch in Professor Eiseley's office. He is such an integral part of the office that when Eiseley and the director of the university museum lunch together in the Benjamin Franklin Professor's office, they have been known to offer a solemn toast to Skeleton No. 4989 as they drink their sherry.

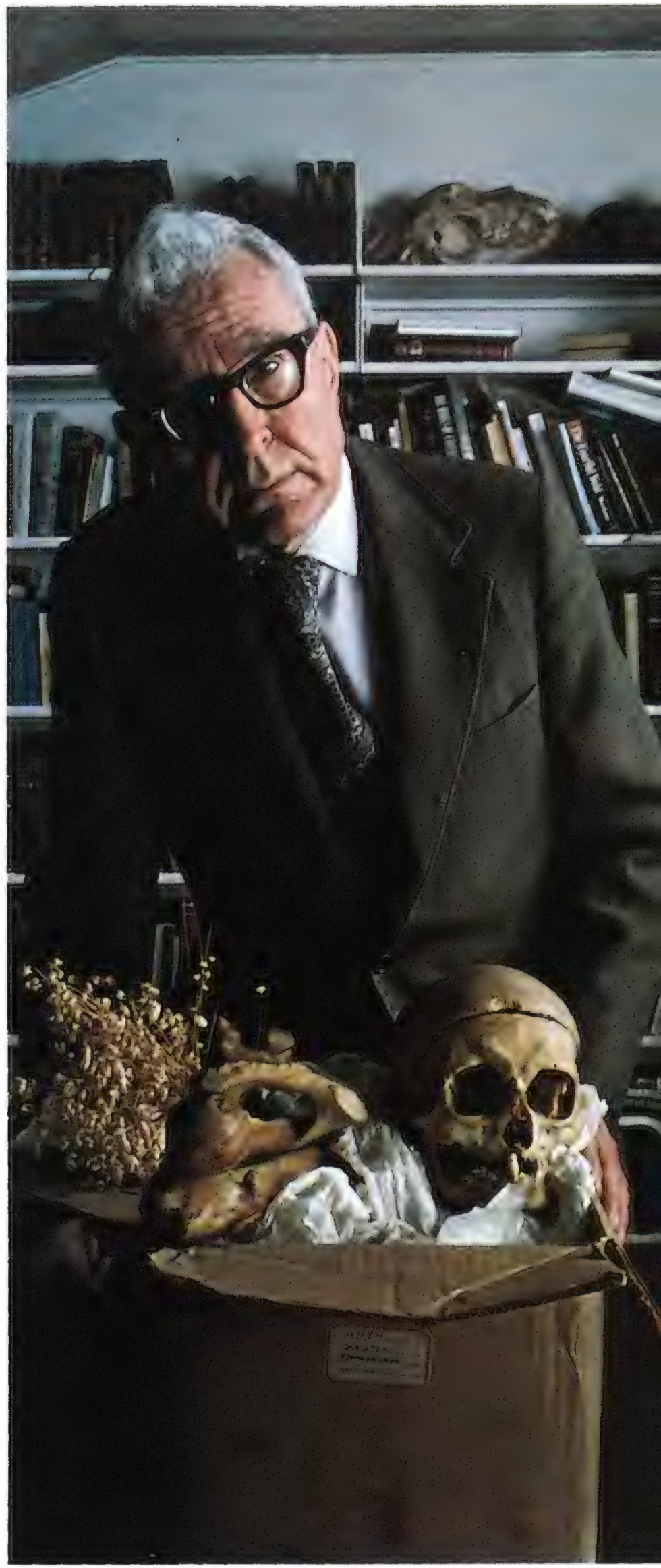
Although only two or three blocks away a large gilt-framed portrait of Edward Drinker Cope, portrayed as he was in life—"his prominent chin was in traditional harmony with his aggressive spirit," wrote his good friend Osborn—hangs on a wall of the Joseph Leidy Laboratory of Biology, as does that of Leidy himself, Professor Cope's mortal remains do not lack

loving attention and care, even though they repose in a simple cardboard carton. Cope is decorated festively at Christmastime with tinsel and holly by the office staff. He has a bunch of dried flowers tucked into his carton in the other months of the year. Professor Eiseley once even bought him a birthday present, a printing block of a skeleton seated before a desk shrouded with cobwebs and spiders. It rests gently against Professor Cope's cranium, the internal capacity of which, Dr. Spitzka had observed, when "measured with dry mustard seed, is 1645 cc." Cope would have been happy to know that Spitzka found his encephalon, with the pia-arachnoid still attached, exceeded in weight that of the average male brains of whites by about 150 grams. Whether or not his encephalon exceeded in weight that of O. C. Marsh no one will ever know, since after his death in 1899 that gentleman's brain, presumably still within its skull, was buried along with the rest of him in the Yale plot in Grove Street Cemetery in New Haven.

Professor Cope has long since "retired to dream of Dinosaurs," as he wrote in a letter to his wife.

Public interest in dinosaurs is still very much alive, although it is difficult to get backing for dinosaur hunting. For one thing, the huge bones present a storage or display problem. It is fortunate that the skeleton of Professor Cope, who was once described by an assistant of O. C. Marsh as a "Monstrum horrendum," takes up so little room in Professor Eiseley's office. What will become of it upon Dr. Eiseley's retirement from his present post no one knows, but Dr. Eiseley has expressed to some of his colleagues the wistful hope that possibly his friend Professor Cope, who has shared his office these many years, might ultimately be interred with him in his own cemetery plot at West Laurel Hill Cemetery in Philadelphia.

Life and death being what they are, and all things being uncertain, this might be a fitting end to Professor Cope's wanderings—it would certainly remove him from proximity to reminders of O. C. Marsh. But as any bone-hunter knows all too well, burial is no guarantee that Edward Drinker Cope—or any form that has ever lived and managed to be preserved upon this Earth—will never again reemerge to be perched upon a shelf, pushed into a box, or hidden away in a locked drawer. In the meantime, Loren Eiseley is keeping careful watch on his guest of honor. "They are delicate, and not in a position to defend themselves," he has written of old bones in his possession. "So I look out for them. I'd do as much for you."



Professor Eiseley's office provides Professor Cope with empathetic, if temporary, resting place.

By Bob Zehring

Coral now decks war wreckage in Truk lagoon

Ships, planes and military equipment litter the depths and lure divers to this former 'impregnable' bastion of the Japanese Empire

Massive air attacks cracked Truk's defenses and destroyed scores of Japanese ships and planes.

The miniarchipelago of Truk lagoon has all the characteristics of a South Seas tropical paradise—lush, green islands; calm, clear waters; majestic palms swaying in trade winds; and a handsome, friendly people.

The tranquility found here today, however, is in harsh contrast to the atmosphere of more than three decades ago and one is reminded of Truk, the Japanese bastion, as VJ-day (September 2) approaches. During World War II, Truk was an anchorage for the Combined Fleet of Japan's Imperial Navy. Japan had gained control of the islands under a League of Nations mandate and, during the 1930s, began to develop a sprawling network of military strongholds throughout Micronesia. Truk figured prominently. It had all the attributes for a strategic naval base. Thousands of miles of ocean and hundreds of outer islands under Japan's control provided a buffer. The deep lagoon could easily accommodate large ships and submarines. The larger islands inside the reef were ideal for base support airfields, docks, harbors, even underground storage. Steep mountainsides formed platforms for coastal guns. The encircling reef had only four easily mined passages which could handle warships.

Naval gunfire from outside the reef could not reach the "Gibraltar of the Pacific," but airpower could. And as the outer island groups—Marshalls, Gilberts and Marianas—began to fall, Truk's buffer crumbled.

The beginning of the end for the stronghold came on February 17 and 18, 1944, in an operation codenamed "Hailstone." U.S. Aircraft from carrier forces assembled 90 miles off Truk roared across the reef at dawn, striking at the airfields and ships at anchor. The two-day raid was one of the most devastating aerial blitzes of the war in the Pacific. The planes, armed with torpedoes and 500- and 1,000-pound bombs, sank more than half of the 60 warships caught inside. Of the estimated 365 planes at Truk, pilots' tallies showed 250 were burned, blown up or shot down. Historians estimated the attack to be 15 times more powerful than the Japanese strike at Pearl Harbor. Persistent but less powerful strikes through the end of the war sent more ships to the bottom, and Truk was ultimately surrendered without the use of ground combat troops. After the war, it became a U.S. Trust Territory.

Meanwhile, below the surface of these calm waters lay mute testimony to the battles that had raged here. Strewn with giant warships, cargo-laden merchant vessels, a submarine, fighter and bomber planes, Truk's sea floor became a vast undersea museum—a time capsule of the war in the Pacific. The effects of nature on this entombed fleet have created a phenomenon.

Off the beaten path of world traffic, Truk slipped into oblivion until the late 1960s, when Air Micronesia began a regular air service. Word of the spectacular underwater scene began trickling out among divers by

A diver breaks the surface of the lagoon, beside the landing strut of an inverted Zero fighter.

Underwater museum of World War II

1970 and 1971. Three of us in Hawaii invited two Italian photographers to join us, made two trips to the lagoon—in the summer of '72 and again in '73—and spent about five weeks exploring and photographing wreck sites for projects associated with Innerspace Pacifica, the international sea symposiums and underwater film festivals held in Honolulu.

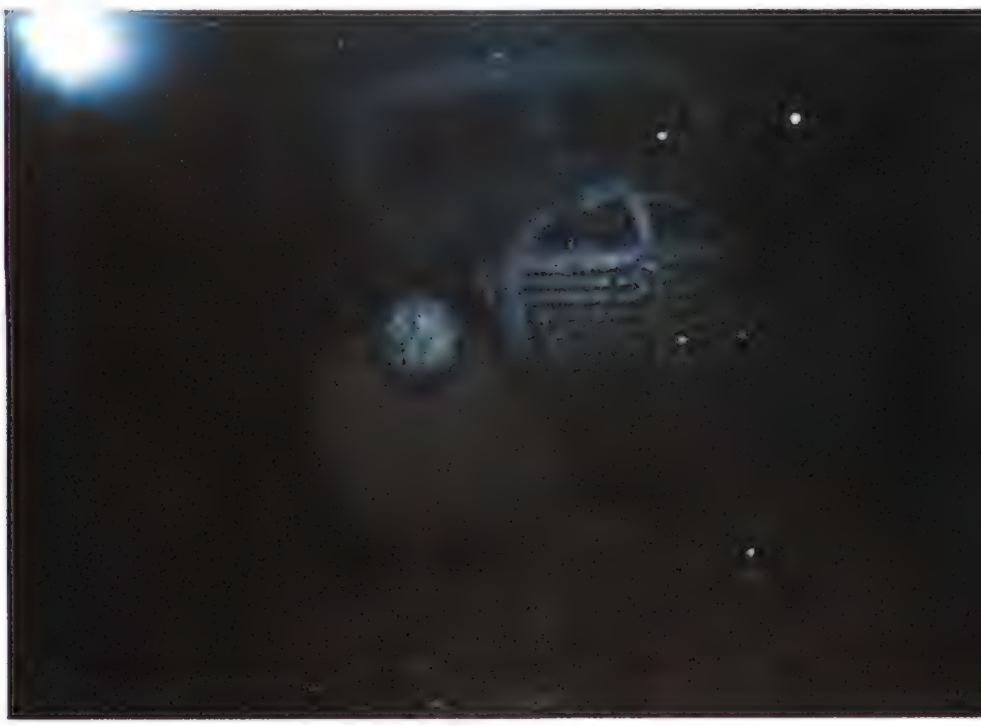
The chief guide for our trips was Kimiuo Aisek, one of Truk's most prominent divers. He arranged the first day of our initial trip to show us a cross section of what was in store. We left the docks on a windless morning and skimmed across water so mirror-smooth it was difficult to distinguish a horizon line separating the sky and the surface of the lagoon. In 20 minutes we were over the first wreck site.

Kimiuo explained that the ship beneath us was a 350-foot *maru* (merchant vessel). Her deck would be about 40 feet below the surface. The water was clear enough for us to make out the bridge and deck sections by looking over the gunwale. We investigated on snorkel to get a general view and made free dives for quick inspection of interesting areas. The ship was resting upright and appeared in excellent condition. Most of her surfaces were heavily overgrown with plant life and coral. Over the years she had accumulated a covering of eerie underwater cobwebs.

Nearby lay the ammunition ship *Sankisan Maru*. To enter her holds meant diving to 85 feet on scuba. Kimiuo led us down, pointing out pieces of equipment still strapped to the deck as we descended toward the dark, square opening of the forward supply hold. Kimiuo's flashlight beamed at the stores of supplies and ammunition. It was like peering into an ancient tomb. A survey from earlier years listed the contents of the hold as ammunition, cans of foodstuffs and large steel barrels, but we had doubts about the accuracy of this information.

Back in our boats, we decided it was time to make a deeper dive, now that we had a feeling for the wrecks and the underwater scene. Kimiuo put us on a big one! The Japanese had converted a 10,000-ton, 500-foot, prewar luxury liner, *Rio de Janeiro Maru*, to a submarine tender and troop transport. The goliath was 600 yards off Uman Island lying on her starboard side in 110 feet of water. Because of her immense size, her port side came to within 40 feet of the surface.

We found *Rio* relatively lacking in growths and extraordinarily well preserved. She appeared to have



Army truck, above, seems unharmed in a ship's hold but a liner's huge propeller blades, left, are encrusted.

sunk while riding at anchor. Her huge anchor chain extended over her bow and faded off into the depths.

Descending on the ship, we could not see her entire length along promenade decks and rows of portholes. A deck gun had a 26-foot-long barrel. Her massive brass propellers probably measured 20 feet from tip to tip. We found little left in her holds except beer bottles, coal and barrels for six-inch guns.

By now we were about eight miles from the hotel, so we headed back in that direction, stopping on the way to snorkel two fighter planes in about ten feet of water. The first was upside down with one of its landing gears jutting out of the water like the skeletal leg of a giant bird. The other Zero rested upright with the tip of its propeller above the surface. Both planes were probably damaged, and crashed trying to make it back to the field.

The aircraft ferry *Fujikawa Maru* offered the greatest variety of all the ships we dived. This 7,000-ton cargo vessel, more than 400 feet in length, rests upright in 110 feet with her fore and aft masts protruding above the surface. Her deck is 40 to 50 feet down with five supply holds—four of which are open.

We were enthralled with the sea life that had overgrown the vessel. Deck railings, air vents, stair steps, loading booms, beams, lifeboat davits, smokestack—almost anything that could serve as a rooting base sprouted a complex group of sea forms. Galaxies of fish swam throughout this panorama.

Now that sport divers are exploring Truk, stores of ammunition in some of the wrecks make local officials nervous. Recent tests prove that these bombs and other ordnance must be respected.

Yamagiri Maru, discovered by starfish divers shortly before our 1973 arrival, went down 1,500 yards off Fefan Island. In her hold lie giant 18-inch shells, destined for use by Japan's two 45,000-ton battleships, *Yamato* and *Musashi*. These are the largest shells ever made for battleships.

Yamagiri rests in 120 feet of water and getting into and exploring her hold was tricky because of the depth, a sideway entry and the pitch darkness inside. Crossbeams gird the entrance way and equipment inside clutters the swim path. The water inside the hold was absolutely still. Beams from our lights illuminated tiny particles suspended as though frozen in space. We cautiously inched our way forward. A pile of large gears, some measuring two feet in diameter, showed up in our lights, then stacks of wound cable. Next we saw a small truck in an advanced state of deterioration. Then the lights spotted the monstrous shells lying helter-skelter—a chilling sight. We wondered what it would take to disturb them after 30 years.

One of the rarer dives in Truk lagoon is to the 330-foot I-169 submarine, one of the largest built during World War II. The sub rests in 140-foot depths. Truk had five subs at anchor on April 4, 1944, when a B-24 raid struck. All were ordered to submerge. The I-169 made the emergency descent but a ventilation tube did not close and flood damage in the control room prevented surfacing. A crew of 77 was trapped inside and two days of rescue efforts failed to raise the ship. Many of the crew, safe behind closed compartments, survived the flooding but perished when the sub's air supply ran out. The Japanese ultimately depth-charged this vessel to prevent it from falling into enemy hands. Yet

Deck gun, shrouded in marine growth, stands on the skeletonic remnant of a steel deck.

Diver explores the well-preserved remains of a Japanese flying boat, sunk before the war.

the sub remains intact from engine room through aft torpedo compartment. In September 1973, a team of Japanese divers returned to recover the human remains from the sub. That was the first time the Japanese government had been permitted to recover the dead from any of the ships at Truk.

Of the estimated 60 ships sunk in the lagoon, fewer than 30 have been located. New finds are reported each year as more exploring takes place. The greatest concentration of known wrecks lies within a six-mile radius of the docks of Moen Island.

Collectively, the ships contain a seemingly inexhaustible inventory—typewriters, telephones, musical instruments, china, medical equipment, cooking utensils, tools, batteries, beer and sake bottles—about anything imaginable and necessary to support battle and the personal needs of troops.

A twin-engine "Betty" bomber rests in 60 feet of water off Eden Island. Both engines were torn off on impact and the pilot's cabin was damaged, but other than that the plane is in fair condition. Not far from this site is a huge sea clipper believed to be a Kawanishi flying boat which flipped on landing and sank in 40 feet of water. We learned of the plane's location from an elderly member of our support crew. His recollection was that it crashed before the war—perhaps 1939 or 1940. The aircraft has an 88-foot fuselage and 128-foot wingspan. Other recent finds include a biplane and a torpedo bomber.

In the "junkyard," between Fefan and Dublon Islands, the Japanese dumped everything worthwhile into the lagoon when the end was in sight. Water depth is 90 feet and the bottom holds ambulances, torpedoes, tow trucks, other items of supplies and equipment.

Dial telephone of World War II vintage looks almost operable. It was for deck-to-deck use.

Wrecks have developed into complex artificial reefs, with some of them supporting far more numerous forms of life than a natural reef. A ship's railing, for example, will host several varieties of hard and soft corals. Sharing the same territory are colorful sponges, giant clams, small crustaceans, sea squirts, numerous kinds of algae. Squeezing in between, and even growing on top of the already dense grouping, are sea grasses and many forms of anemones. In the deeper water, black coral trees add to the kaleidoscope.

Continuing up the chain of life, tiny fraction-of-an-inch fish with transparent bodies find shelter among the growths. Slightly larger species brave the open waters—a foot or two from the plant life. They turn and dart in perfect synchronization as though responding to some silent cue. In the background are the jacks, yellowtail, mackerel, occasional tuna, large groupers, barracuda and, now and then, a shark. But sharks seem to find the lagoon's outer reef more to their fancy.

That's Truk Lagoon. A most unusual museum.

Lt. Col. Zehring is director of documentation photography in an Air Force section and an avid diver.

Ship's lantern aboard a sunken wreck has attracted a smothering growth of coral flowers.

Members of the Plymouth Congregational Church gather in restored Guild Hall for the unveiling.

Embroidery shows Puritan history

A colorful and unique embroidery showing the early history of the Protestant churches in this country was completed recently at the Plymouth Congregational Church in Minneapolis. The work was originally conceived several years ago as the highlight of the restoration of Guild Hall, a fellowship meeting place built in 1909. The historical details for the embroidery were sent to Pauline Baynes, one of Britain's foremost illustrators. Her interpretation included three panels portraying the church's early ideals of worship, education and freedom. The 16-by-25-foot embroidery was executed by 50 "needlers," all members of the church.

The panorama consists of three panels. The center, with the theme of life and its renewal, has arrival

of the *Mayflower* and the first Thanksgiving. The left panel portrays early concern for education and the building of churches; the right panel symbolizes the struggle for freedom and civil liberties.

Photographs by Frank Scherschel

By Stuart Griffin

Care for a fight? These lads will storm your castle

Sealed Knot Society, a British group partly history buffs and partly mad as hatters, has halberds and harquebuses, will travel

On a bright May afternoon I swung myself over a stile and stepped down into August 1642. Sunshine dappled a scene of beauty and color. Hirsute stalwarts thudded by on horseback, wearing lace-lined velvet, leather and steel—faces minified by Cromwellian lobster-tail helmets and King Charles slouch hats trailing plumes. Ladies and "ladies" fluttered along their line of march with their own pretty pageant of bosomy bodices, wind-lifted skirts, and ringlets escaping their bonnets.

Dogtrotting past me were members of the Sealed Knot Society jogging into the hell-broth of war. These Roundheads and Cavaliers, gentlewomen and camp followers would soon reenact a siege of England's Civil War here at Warwick Castle.

To report the event I had costumed myself as "Brother Stuart" in my daughter's Dracula cape, with cowl and bare feet. Photographer Janet March-Penney was bloused and kerchief-capped, her great-grand-

Grunting as in a Rugby scrum, Roundheads and Cavaliers go to it next to 20th-century power lines.

Fallen Royalist (Knotsmen hate to die—they miss the fun that way) is ministered to by camp follower.

mother's shawl blowing across her camera lens. Sealed Knot, we had been told, demands absolute authenticity, total discipline. It had been conceived, its Captain-Generall pointed out, in dedication.

The original Society in Parliamentary times was a cabal plotting the Stuart Restoration. Its emblem, taken from the great chain of the Order of the Garter, shows sealed knots alternating with roses. Today's Society, 2,000 strong, is organized as a 17th-century army with "small staffe, horse, foote, dragoones, and a trayne of artillerye."

It comprises Corporalls of Horse, Agitants, Regimental Armourers, a Heraldic Unite, Ensigne Reformados, Lance Pesados, Gentlemen of Ye Armes; padres, royal surgeons, petardiers, mattrosses, pikemen, musketeers, trumpeters, drummers, pages and Rouge Croix pursuivants. Impersonated are the Lord-Generall of the Roundheads, the Feilde Marshall of the Royalists, Oliver Cromwell and the fey King Charles. Women also serve—in the Royalists' "Monstrous Regiment" and Cromwell's "Maids of Chastity"; and children, too—as drummer boys and pages.

The society's founder, Brigadier Peter Young, DSO, MC, MA, FSA, HistS, has "good medals" from real war and, as Reader of Military History at Sandhurst Royal Military Academy, has proof of scholarship. Rotund, yet swashbuckling, he led the First Commando Brigade onto Dieppe's frightful beach and has written several books on England's Civil War. Young created Sealed Knot in 1968, first with five friends at the Mitre Tavern in Oxford, later at a garden party—his guests in Cavalier attire—to promote his first book. Roundheads were subsequently sworn into the Society since it could hardly hope for authenticity without Cromwell's as well as the King's men.

Its first battle trapped both newspaper attention and

Pikemen advance on Warwick's defenders as fracas of England's Civil War is restaged.

public fancy. Some 350 men, mostly from Sandhurst, fought in tin can and tinfoil helmets and armor, makeshift hand-sewns and theatrical costumes. Today, seven years and some 50 battles later, Sealed Knot is a household word, staging on weekends and holidays, March through October, such famous Civil War encounters as Ludlow, Nantwich, Marston Moor, Naseby, First and Second Newbury, Gloucester, Lympne Castle and Warwick Castle in England; Gorey Castle on Jersey; Kilsyth, Philiphaugh, Killicrankie and Dunkeld in Scotland. Colorful, authentic regiments have been mustered—Prince Rupert's Bluecoats: Sir William Bagot's Purplecoats; Leven's Scots Army; the Earl Marischal's Regiment; the King's Lifeguards; the Queen's Regiment of Foot; Sir John Meldrum's Artillery and Von Pappenheim's Dragoons.

Besides reenacting Civil War encounters, preferably on actual sites and true anniversaries, "The Knot" produces pageants, books and papers; has been widely written about in Britain and televised; provides entertainment and greater awareness of England's heritage; and has charitable status as a limited company. It fosters "Battles for Sale." A thousand members refought Naseby, for example, before 20,000 spectators and raised about $12,500, after expenses for horses and pyrotechnics, for underprivileged children.

I was curious how Warwick Castle would be besieged, without any dress rehearsal. The officers' briefing made it clear. I learned that Sealed Knot combatants had been briefed beforehand, that artillery knew its role in advance, as did cavalry (60 percent cavalry-*women,* curiously). Artillery is either small, homecrafted and smoothbore, or pre-Napoleonic culverins and mortars named "Sweet Lippes," "Forget Me Not," "Magog" and "Bogle." The pieces go off with a heart-pounding boom and flash, and fire tennis balls.

Knot members pay lodgings, transport and uniforms, joining for an annual fee. Enlisting as pikeman or musketeer, Royalist or Roundhead as one elects, one suits up to match the period with the purse. Girl friends and wives handcraft the simple uniforms, but not the more costly elements—lobster-tail helmets, breast and back armor of stiff leather or real metal, thigh boots and plumed hats. One Lord-General struts about in a $1,200 uniform.

Horse and foot approach campsites with enchanting incongruity—on bicycles and motorcycles, private trailers and vintage motorcars. Others brave stares and giggles aboard bus and train. Knotsmen ape the 17th century in their life-styles, with long hair, period beards and moustaches, enjoyment of mead and sack, and King Charles spaniels for pets.

Roles are faithfully executed. Charles II is Lieutenant-Colonel J. B. R. Nicholson, ex-Indian cavalryman; Oliver Cromwell is Channel Island businessman John Tucker. Parliamentary Horse Commander, Sir William

Stuart Griffin is an expatriate American author who lives in an English cottage named "Wit's End."

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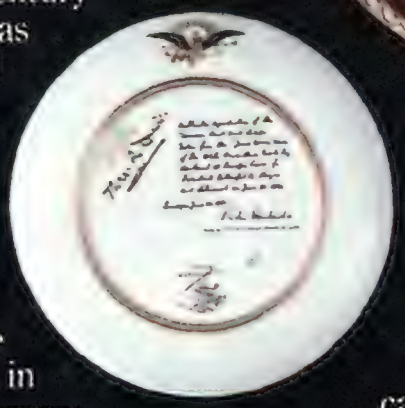

On the back of this unique plate appears the Presidential Seal, which Mrs. Hayes decided was inappropriate for the front...the artist's monogram and date of his painting...the original Haviland & Company mark with the artist's signature...and the authentication of this commemorative re-issue. In addition, the foot of the plate is banded in gold.

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Roundhead sharpshooter fires on Royalist attackers. Warwick Castle was held by Cromwell's forces.

Dead and wounded, dripping catsup, are trundled off the field, but most slip back into the ranks.

Sealed Knot Master at Arms Corps puts on display duel between Cavalier, left, and Roundhead.

Waller, is Gerald Bradford, a town surveyor. Publican Allan MacNeill, of the "New Yew Tree," has recruited his Highland mercenaries—11 kilted Aberdonians quick-marching to the wail of a Clan MacNeill piper—for the Stuarts.

Sidewalk "blokes" from East London deploy as Prince Rupert's Bluecoats, destroyed at Naseby in 1645, revived at "Naseby" in 1973. They wheel into the firestorm, now as then, singing Royalist ballads. Authenticity persists off battlefield. Cavaliers and their ladies twirl to tunes played on ancient instruments, while Roundheads chuck village wenches surreptitiously when the parsons are not about.

Royalist-Parliamentary banquets often follow battlefield turmoil. Both sides feast with fingers on roasted fowl and savor such "removes" (courses) as baked herring in small beer, syllabub and the "London Particular," washed down with ale and posset—hot milk curdled by wine and spiced. Both sides roar out toasts, "Cromwell, God Keep Him" and "God Save the King . . . and a Pox on Parliament!"

On the field, signs and loudspeaker announcements emphasize—"BATTLES ARE DANGEROUS." Provost-Marshals in knee breeches, lacy waistcoats, and buckled shoes sternly keep spectators behind barriers and pikemen from surging into the crowds. They step briskly to halt fist fights if tempers rise too high, and they cry "Lad down!" and shove the ranks apart if a chap has fallen and risks a trampling.

Accidents will happen

Weapon points are blunted, edges taped, swords drawn only by authorized persons, pikes and halberds clashed only at high port, never swung or thrust, firearms loaded only on battlefields, with only wadding used. Care is taken not to frighten horses unduly. Artillerymen answer to master gunners, and special effects are controlled.

A musketeer, it is true, once skidded on a cowpat, buttock first onto a pikepoint. Halberdiers have been lifted from the sod in a "hedgehog of pikes" and suffered crushed ribs, a broken arm or leg. Powder burns occur. A horseman was once spitted, not seriously, urging his mount into a line of "Swedish feathers"—pikes jabbed into the earth, angled up and out at underbelly height, in the foot soldiers' classic pike defense against cavalry.

Physical fitness naturally minimizes mishaps, so battles are for the fit, and preferably the young. Battle losses more often are of clothes than of those in clothes. We overheard one Nell Gwyn girl bewailing her ripped, muddied cloak. "It's best green brocade," she sobbed, "me mum's front room window curtain."

Sealed Knot follows a scenario script religiously.

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Fanfare. Cannon duel. Cavalry charge. Pike clashes. Musketry. Skirmishes. Siege and sally-port struggle. Investment and the sack. Stronghold taken, put to fire and the sword. Battle is enjoyed for two hours—longer, sometimes, than the original engagement. Sometimes Sealed Knot fields more campaigners than participated in the historic encounter.

I take up a position near a grove of old, old English beeches and watch the siege of Warwick Castle pick up in tempo. Cavalry enters, at a trot, a canter, a gallop, unconvincingly. Horsemen dervish about, raising dust from the dry earth and giggles from the onlookers. All that shellfire, that musketry, yet not a saddle empties—a bit jarring. Better marks for artillery. Gunners and fireworkers toil. Culverins belch flame, trail smoke, and jump on their carriages. The public cheers the agile crews in breeches, vests and tasseled caps.

Pikemen, mortised in close with halberdiers, and with musketeers only footfalls behind, are fine, whether Royalist or Roundhead. Foot soldiers sidestep the musketeers, wary of powder burns. Scots dragoons stage a splendid attack, in great casques, shiny cuirasses, the plaid they will sleep in trailing over their shoulders, crouching to charge as the claymores flash.

Skirmishers plod forward. A volley rolls over the meadow, smokily. Nobody crumples. Nobody drops. I turn to the watchful Brigadier and ask why. They don't like to play dead, he tells me. "Besides," he adds, "we cannot afford too many deads. Need the living, y'know. Can't stage the battle properly, if too many are off their feet. You're right though"—he darts an eye at the crowd—"hurts the effect."

The Brigadier must somehow have conveyed his second thoughts. Pikemen start to pinwheel and topple. Here and there a musketeer throws up his hands; a halberdier flutters and sinks to his knees. Some of them crunch capsules and bleed at the mouth. Out shriek the camp followers, deftly daubing faces and uniforms with "Kensington gore" (catsup). Out trundle the death carts and soon the fallen are hanging hideously over the railgates, the grass they have vacated bright with bloody dollops. Old Stan Clarke, Chaplain Generall, totters forth, bunching up his robes with one skinny hand and blessing with the other. Carts rumble off, but I see the dead slip furtively back.

One can smile, of course, but somehow I was reminded, for all the make-believe, of what had occurred, three centuries and 30 years before, right here. Funny how a half-forgotten, not important little poem should spring to mind:

The glories of our blood and state,
are shadows, not substantial things,
There is no armour against fate,
Death lays his icy hands on Kings.

James Shirley's small words somehow lurk and haunt, all afternoon.

Often, after Warwick Castle, and later, after Gloucester, I kept mulling the many replies to my question —why join Sealed Knot?

"A bit of a lark," was one, "something fetching for a weekend, not just the telly and the local [pub]." "Smashing family outing," was another, adding "I felt I'd been back in the 17th century and since I don't much like the 20th, I didn't mind." A shop clerk called it "a bloody marvelous way to let off steam." A city man, viewing Monday London-office-life distastefully, liked the physical relaxation. "After a battle, you're shagged out . . . it's wizard."

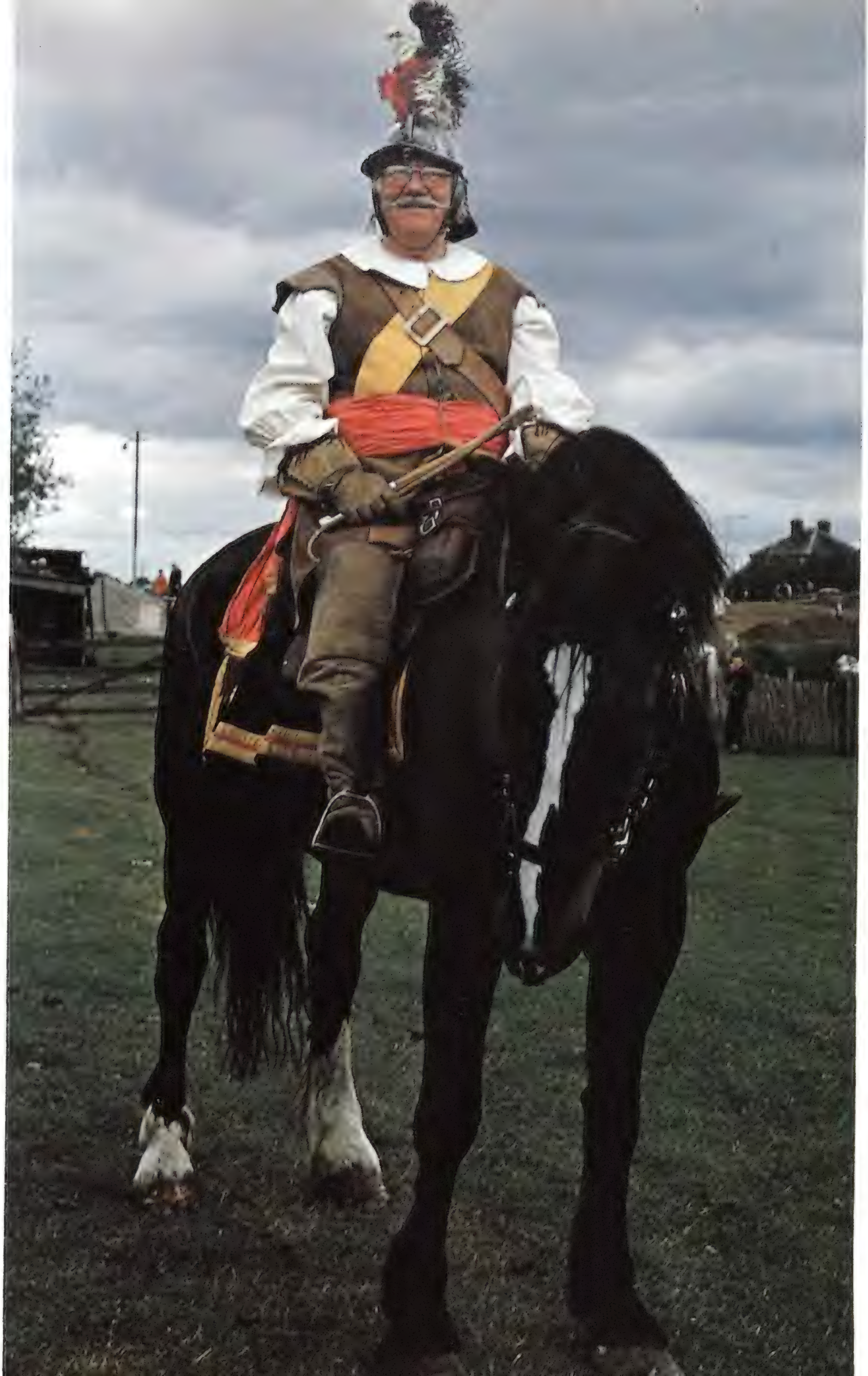
Criticism of Sealed Knot can be acerbic. "In harmless enough fashion," one columnist carped, "this group seeks what is basically escapism dressing up in costumes of centuries ago, creating artificial worlds it was born too late to experience. It's all quite sad."

Knot members have been scored as weekend soldiers, crypto-Rotarians, even military. No less have they been lauded as good citizens. But an agreeably self-mocking verdict seems the best answer as to why the lure of the Sealed Knot. It comes from Colonel Nicholson.

"Englishmen love and welcome a nut, and there are many of them around. The entire Knot exercise and its continuation and growth show Britain, happily, has a goodly number of these eccentrics—enough to go around—which, given these parlous times, isn't perhaps too bad a thing."

To which may be said, in Cromwell's word, and perhaps the King's—Amen.

Sealed Knot's founder, Brigadier Peter Young, in Roundhead garb, once led commandos at Dieppe.



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Book reviews

New England Cemeteries
Andrew Kull
(The Stephen Greene Press, $9.95)

Andrew Kull's *New England Cemeteries* is a state-by-state annotated guide to 262 graveyards, where more than 300 years of the American past lies buried.

Gravestone epigraphy and relief is about as close as America's Puritans got to producing an art form. The images they denied themselves in their churches were lavished on the graves with baroque exuberance. The stonecutters, about whom a good deal is known, departed from English traditions and developed their rustic techniques relatively free from European influences. Their carving was linear, more like engraving than sculpture, perhaps because the earliest of them first practiced their craft on the wooden markers that stood in graveyards like so many signposts until about 1675, when slate and clay stones came into common use.

Was gravestone relief decorative or symbolic? The point is debated, but most likely the craftsmen intended to convey a message. The symbolism was conscious and didactic, like that in the medieval art defaced by the Puritans' iconoclastic cousins in England, and a lot of New England theology can be read in it.

The Puritan was put in the world to be its master, but he was not of it. He wanted no gloom in his graveyards. There was hope, indeed anticipation, in the injunction, "Arise, ye Dead," carved so frequently on his gravestones. The winged head at the top of many stones was purposely ambiguous. The initial impulse is to see in it a death's head, but it

was also an angel or a glorified soul, often accompanied by symbols suggesting a life to come. Only in death, the stone reminded, was birth into eternal life possible for the Christian.

Symbol-making was institutionalized in New England and, as elsewhere, was used by the agents of orthodoxy to restrain enthusiasm and mysticism by lending order and structure to their expression. The symbols, always set outside the church building, helped make faith in the infinite immediate in ways that pulpit verbalism could not.

By 1820, the old iconographic tradition had died out and the sturdy symbolism of the past had been replaced by simpering cherubs, perhaps because patrons were uneasy with the idea of immortality.

This is the most thorough and instructive guidebook of its kind in print, and it ought to remain the standard reference for some time. The only thing more impressive than the research involved in collecting the historical notes, biographies, anecdotes and curiosities included in almost every entry is the author's persistence in visiting 262 graveyards!

Because of its intended purpose as a guide, this book does not say much about the art of the gravestone or interpret its

Titus family gravestone, carved in stone, at Springfield, Massachusetts.

symbolism. So, before setting out on a really serious tour of New England graveyards, have a look at Harriette Forbes' *Gravestones of Early New England* and Allan Ludwig's *Graven Images.*

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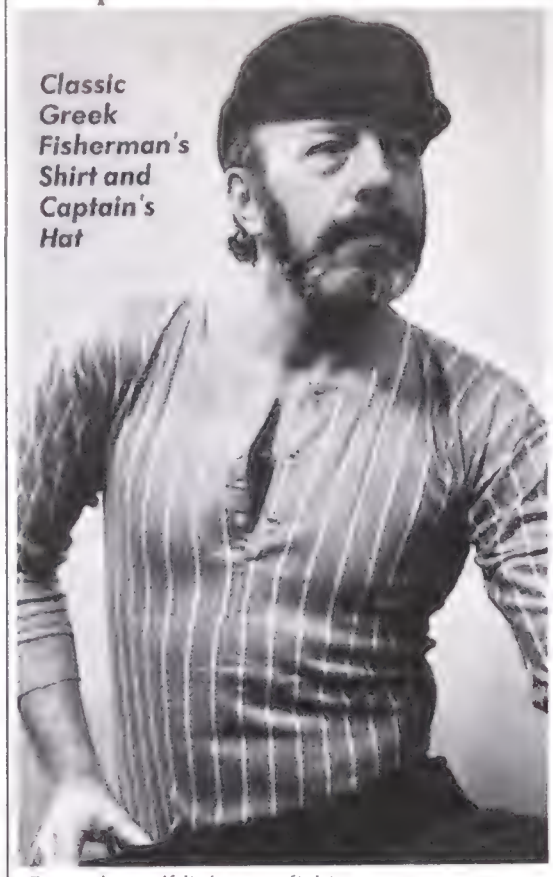

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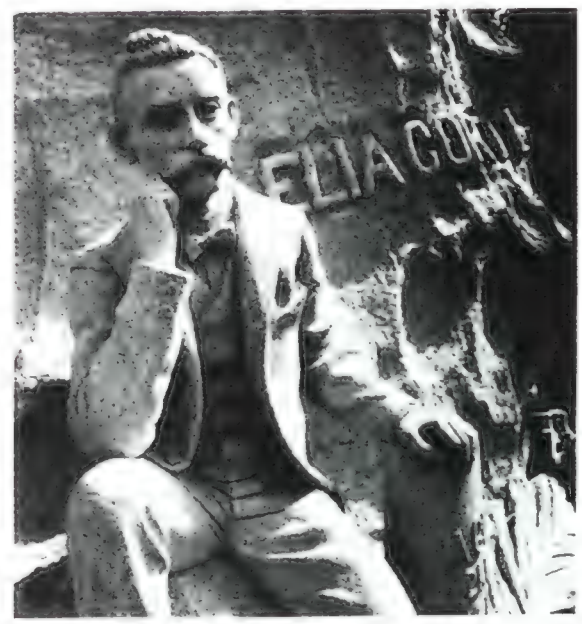
Kull's crisply written text is illustrated by 33 photographs of good quality. Entries are marked to indicate sites of particular historical interest, scenic beauty or artistic merit. Maps are included and directions are provided to help the first-time visitor reach out-of-the-way spots.

I remember a teacher, who wasn't an American by birth, reminding a class in U.S. history that no people could know their past who could not "stand on the bones of their fathers." Few of us can. The numinous churchyards and small-town graveyards that Kull lists are rare compared with the anonymous suburban cemeteries which we have come to look upon as the norm. But in a sense, which becomes more obvious as one thumbs through Kull's guidebook, those New England graveyards hold the bones of the fathers—and mothers—of us all in our rootless, pluralistic society: The New England Puritan is the dominant spice



The grave of Elia Corti, master granite carver, in Barre, Vermont, cemetery.

flavoring the American stew. That will be this book's appeal even outside New England. And that's a good reason for spending part of a holiday during the Bicentennial touring New England to visit graveyards.

—Robert Rinehart
Historian and specialist in medieval and Renaissance studies

The Pied Pipers
Justin Wintle and Emma Fisher
(Paddington Press Ltd, $10.95)

What should children read? Almost anything, say the authors who are inter-

viewed here. They are writers of children's literature, a field which has become increasingly important to writers, publishers and, possibly, children.

Accordingly, they write books with situations and incidents that range from the traditional to the fantastic. There are the usual talking animals; the crises in families, in schools and in the town; the journeys ending after hardship or disaster.

But things are changing remarkably. Lately a lot of children's literature seems to include or even focus on social issues, and more and more is published about relationships between races and between social classes. Such books do not reach an easy conclusion; at a younger and younger age children are exposed to the notion that most things do not end "happily ever after," that reality is complex, and that relationships between people are subtle and changing.

The trials of adolescent identity are presented in books that range from the more standard tales of teen-age heroism and adventure to stories of young people struggling with the pressures of conformity, with restrictive parents, with increasing sexual desire. Some preschool children's books introduce characters and landscapes that seem almost mystical. Maurice Sendak, who writes and illustrates such books, claims that his young readers are more open to suggestions of the unknown than their parents are.

About half the writers interviewed are English, half American; and a few are familiar names: Sendak, Roald Dahl, Dr. Seuss, E. B. White. Others are not as well known as the characters they have created: Laurent de Brunhoff's Babar the Elephant; Richard Scarry's busy societies of mice, cats, dogs and pigs, for example. Most of the 23 writers in the interviews began their work as children's writers and have continued to write mainly for children. They represent a wide range of styles and themes; more than that, together they represent a tremendous expansion in the field of children's publishing, and a concurrent rise in standards in that field.

Over the years children's literature has attracted some substandard writers who were unsuccessful on the adult market, and who found publishers willing to put out almost anything considered sufficiently saccharine or benign for children. Even today, primary school readers are incredible examples of dull, silly writing.

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Children remain almost completely at the mercy of adults—publishers, parents and librarians.

The Pied Pipers focuses attention on a deserving, at times distinguished, group of writers, but it is lacking on several counts. The editors seem not to have decided quite for what purpose their book was written, so that it does not fit easily into any category. As general reading material the interview questions seem tedious and rather particular, so that often both question and answer are interesting only to someone familiar with the book in question. Two of the best known American authors, E. B. White and Dr. Seuss, are interviewed only by letter and rather briefly, so that part of the pleasure one feels at the prospect of getting better acquainted with these old friends is cut short. Nevertheless, *The Pied Pipers* introduces valuable perspectives on changes in the field of children's literature and points to common differences between adult and child readers.

It may be that sometime in the future children themselves will have the chance to exert more influence over the books they get to read. In the meantime it seems hopeful that the field is receiving more attention from both publishers and critics. We can expect more good children's authors, and more books—like *The Pied Pipers*—recognizing their abilities.

—Jane Conley
Free-lance writer and editor

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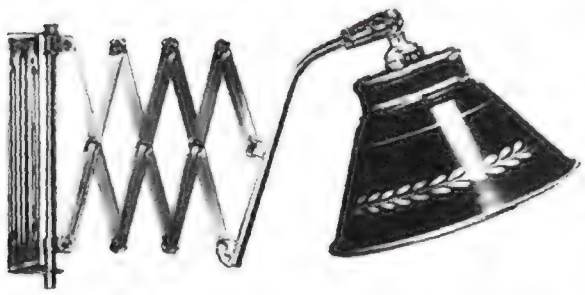

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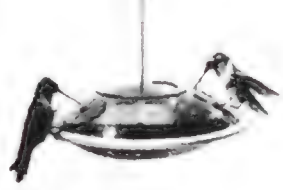

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cific Coast League, this book is for you. If you are a minor league devotee, for whatever reason, there is enough material here to win a thousand bets, if you can find takers for such matters as who invented the curve ball (Candy Cummings in the 1860s), or who the first professional player was (Alfred J. Reach), or what his salary was ($25 a week). There are hundreds of such facts here, with enough interesting narrative to hope that someone out there will one day write the definitive history of the minor leagues, and make it readable throughout. Until then, *Bush League* could be the penultimate statistical base for such an effort, but it probably should be added only to a hopelessly unreconstructed baseball nut's library.

Lee Gutkind's book is major league in every way, and is the first effort to see the game as umpires see it. No one reading it will ever again look at the "men in blue," often serenaded with the strains of "Three Blind Mice," without more compassion and understanding. While nothing but persistent lightning bolts could end the ingrained American tradition of insulting umpires, or ignoring them for their usually professional job day by endless night through the long season, this sensitive, never melodramatic book will add greatly to every fan's appreciation of the game and of the men who keep it moving despite every imaginable kind of verbal and corner-cutting abuse.

Throughout the tense National League season of 1974, Gutkind followed an umpire team consisting of a racially and ethnically mixed balance of four men who emerge, each in his own way and time, as human beings trying to make the best of a difficult life, a life of extreme loneliness and fatigue with few rewards outside of their rarely seen families and friends, almost none of whom are baseball players. For insights into baseball as it is, without any of the halos that surround the game, this work ranks with Jim Bouton's *Ball Four* and, for interpersonal relationships, Mark Harris' remarkable novel, *Bang the Drum Slowly*. Like Bouton's book, this one doesn't spare any of the more zestful four-letter words, and probably will be denounced by leaders of a sport who persist in enveloping the game with silver bunting, and hoping that everyone associated with it will be as meek as three blind church mice.

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**The Village Voice*

his masterful ear for the vernacular and his ability to listen and record with sympathy—combined with a fine racy style (his previous book was titled *Bike Fever*)—has extended our knowledge of a sport that continues its hold on large segments of the population. Indeed, Gutkind has not only given us the best seat in the house from the angle of the men who have the best view of the game, but he has created a surprisingly and delightfully refreshing view of our most nonviolent, enduring national pastime.
—*William F. Claire*
Poet, editor and catcher (retired)

The Politics of Extinction: The Shocking Story of the World's Endangered Wildlife
Lewis Regenstein
(Macmillan, $9.95)

Many good things came out of the American public's new sensitivity to environmental problems just five or six years ago, but one of the most dramatic was an awareness of the urgent need to better the welfare of the world's wildlife. It can be fairly said that up to that time the exploiters had the upper hand. Both the takers and users of wild animals and their products sheltered their consciences with the semiscientific notion that any wildlife population could, and should, be managed to produce a surplus. Several species were saved on the very brink of extinction, but a host of others joined the expanding threatened and endangered lists.

This situation has changed and changed for the better. A fair share of the credit must go to the humane groups, or preservationists. One of their most effective members, Lewis Regenstein, has now written *The Politics of Extinction*, which chronicles his efforts in bringing to the public's attention the plight of wildlife, particularly marine mammals, wolves, bears and wild horses. He gives lengthy consideration to the development of the laws, treaties and regulations that preservationists have felt vital in bolstering their cause. At first the dominant gun lobby and "manage-everything" groups treated the "bleeding hearts," as they were derisively known, as sheep in wolves clothing, but as the issues were rapidly politicized they found the opposite to be true. Today the preservationists not only have counterbalanced the hunting lobby but often have them on the defensive.

The account of how this was accomplished should make good reading, but unfortunately this book falls far short of the mark. This is not really a story about endangered species, but rather a polemic on the horrors of killing animals, with attendant faults of overstatement and repetition. Additionally, there is a great deal of poor or inaccurate natural history caused by Regenstein's penchant for anthropomorphism. Is it wise to continually place such value on the "intelligence" of the species he champions? What happens when the public is called upon to help save crocodiles, butterflies or wild orchids? Most of the "shocking story" offered in the subtitle turns out to be antiquated innuendo not much worthier than that dished out by his opponents. Disappointment is the greater because all this is so unnecessary. Indeed, the decimation of our wildlife is a shameful tale, and bureaucratic inanities such as the government's having to spend millions restoring the damage of their own predator-control program need no moralizing embroidery.

Conservationists will have the greater difficulty accepting Regenstein's doomsaying and absolutism. He would have us believe that all animals are endangered and anyone suggesting otherwise is not a "true" conservationist. Consequently, short shrift is given the conservation movement before the preservation crusade began in earnest. Preservationists assume that man is somehow apart from the ecosystem, that killing animals is unnatural and that law will curb this wicked instinct. Such an unrealistic philosophy would promise perpetual conflict—and, of course, if the law proves unenforceable the affected species are the inevitable losers. Regenstein doesn't really preach what he practices, however, since he is a successful politician, and politics is the art of compromise. Of greater concern is the preservationists' key assumption that the direct killing by humans is of equal, or greater, threat to wildlife than the indirect killing caused by destruction of habitat. Surely this just isn't so.

No matter, the preservationists will find this book of great import. The hunter could read it to know his foe better and the conservationists, well, they might discover new approaches in trying to unite all factions in restoring our wild heritage.

—Michael R. Huxley
Deputy Assistant Secretary for Science,
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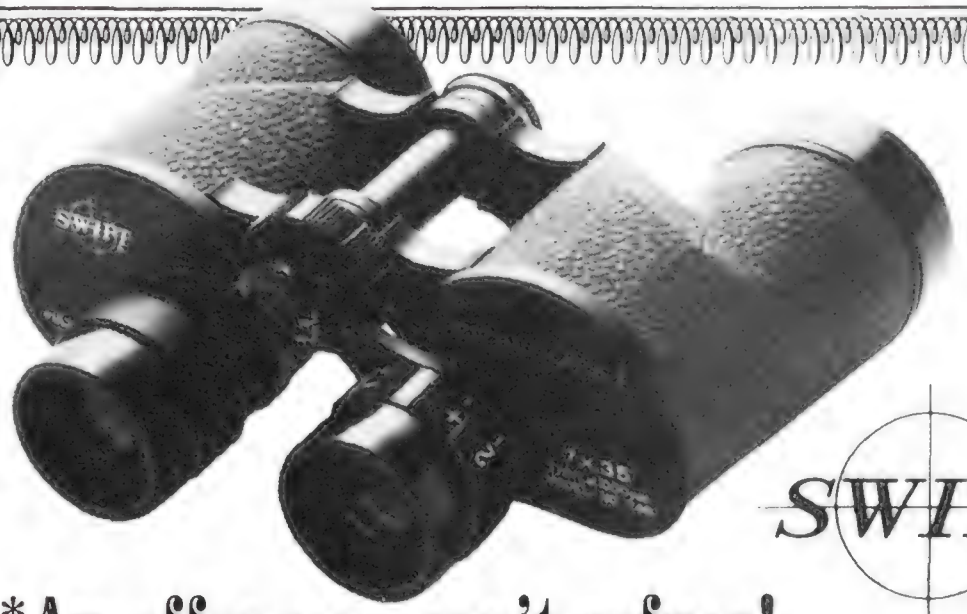

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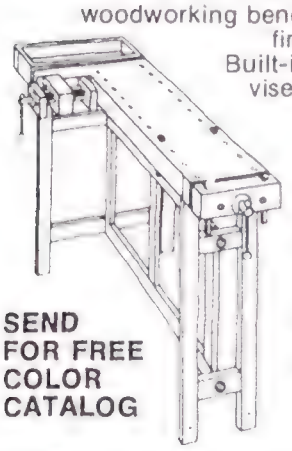

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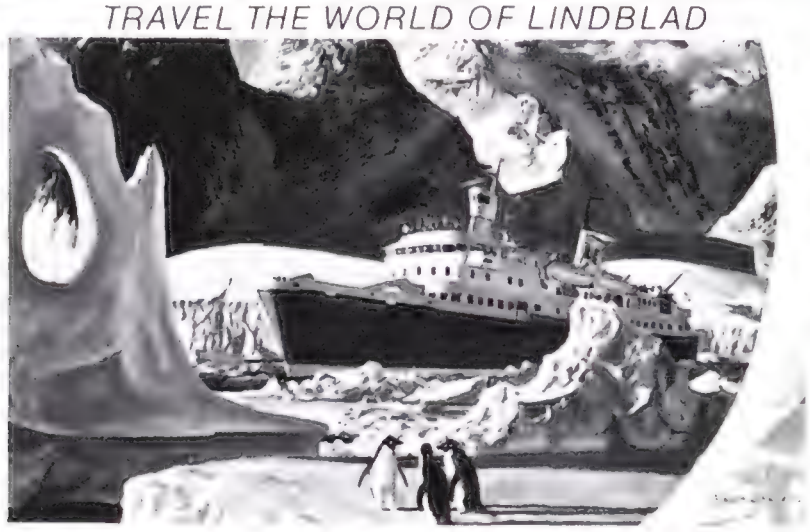

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Barges (p. 28)

The Log of the Betsy Ann by Frederick Way jr., Robert M. McBride & Company, 1933

Life on the Mississippi by Mark Twain, reprint of the 1885 edition by Harper and Row Publishers, Inc., 1950

Towboat River by Edwin and Louise Rosskam, Duell, Sloan and Pearce, Inc., 1948

Lamy of Santa Fe (p. 36)

El Gringo; or New Mexico and Her People by William W. H. Davis, Arno Press, 1973, a reprint of the 1857 edition.

Santa Fe, The Autobiography of a Southwestern Town by Oliver La-Farge, University of Oklahoma Press, 1959

Southwestern Journals, 1880-1882, volume I, by Adolph F. Bandelier, edited and annotated by Charles H. Lange and Carrol L. Riley, University of New Mexico Press, 1966

New Mexico's Own Chronicle, Three Races in the Writings of Four Hundred Years, edited by Maurice Garland Fulton and Paul Horgan, B. Upshaw and Company, 1937

Provincetown (p. 44)

Mooncussers of Cape Cod by Henry C. Kittredge, Archon Books, 1971

Visitor's Guide to Cape Cod National Seashore by Margaret H. Koehler, The Chatham Press, Inc., 1973

Provincetown Profiles and Others on Cape Cod by Frank Crotty, Barre Gazette, 1958

Barro Colorado (p. 52)

The Life of the Jungle by Paul W. Richards, McGraw-Hill Book Company, 1970

The Land and Wildlife of South America by Bates Marston and the Editors of Time-Life Books, Time Inc., 1964

The Tropical Forest, Ants, Ants, Animals and Plants by Mary Batten, Thomas Y. Crowell Company, 1973

Tamayo (p. 64)

Rufino Tamayo by Robert John Goldwater, Quadrangle Press, 1947

Tamayo by Emily Genauer, Harry N. Abrams, Inc., 1974

Cope's Bones (p. 72)

Cope: Master Naturalist by Henry Fairfield Osborn, Princeton University Press, 1931

O. C. Marsh, Pioneer in Paleontology by Charles Schuchert and Clara Mae LeVene, Yale University Press, 1940

Men and Dinosaurs by Edwin Harris Colbert, E. P. Dutton & Co., 1968

The Bone Hunters by Url Lanham, Columbia University Press, 1973

Truk (p. 76)

History of U.S. Naval Operations in World War II by Samuel Eliot Morison, Little Brown and Company, 1955

"Recycled Bombs," by Bob Zehring, *Skin Diver,* volume 24, 1975

"It Wasn't Really Your Average Diving Job," by John Oakes, *Micronesian Reporter,* volume 21, number 3, 1973

Embroidery (p. 82)

The Plymouth Embroidery, brochure from Plymouth Congregational Church, Minneapolis, Minnesota, 1974

The Sealed Knot (p. 84)

The English Civil War, A Military History of the Three Civil Wars (1642-1651) by Brigadier Peter Young and Richard Holmes, Eyre Methuen (London), 1974

The English Civil War, A Military Handbook, edited by John Tucker and Lewis S. Winstock, Arms and Armour Press (London), 1972

The Cavalier Army, Its Organisation and Everyday Life by Brigadier Peter Young and Wilfred Emberton, George Allen & Unwin, Ltd. (London), 1974

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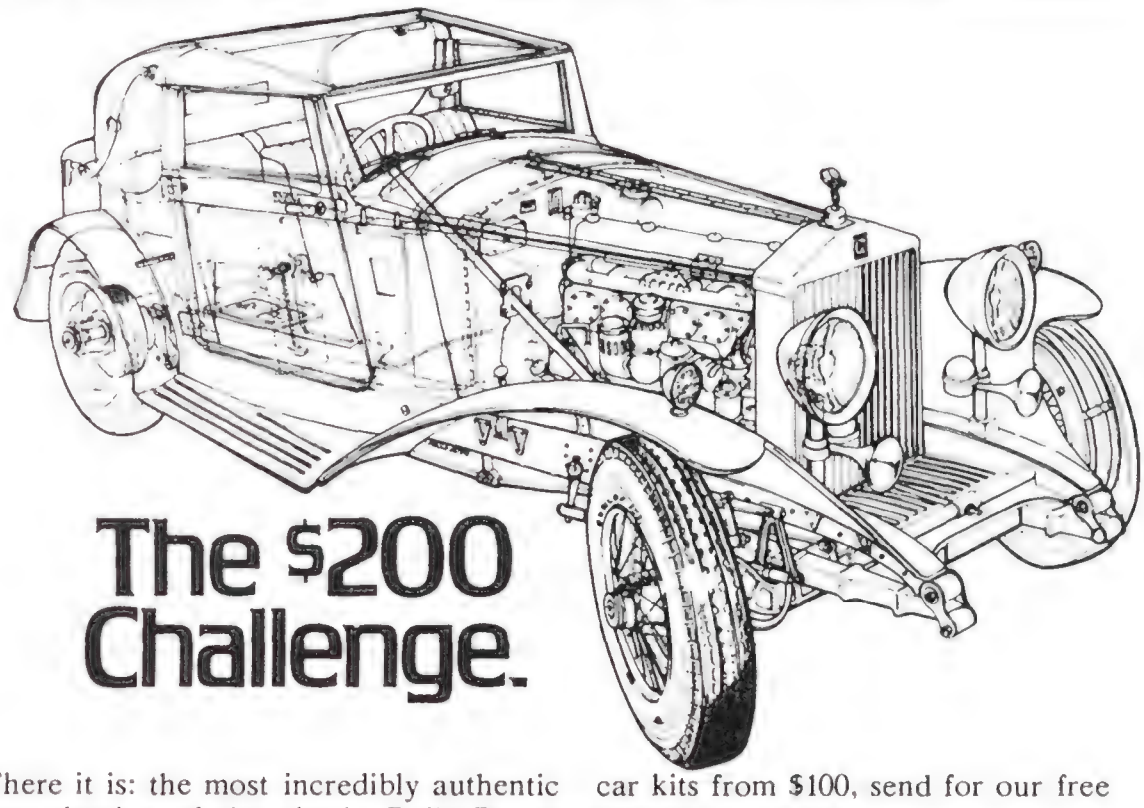

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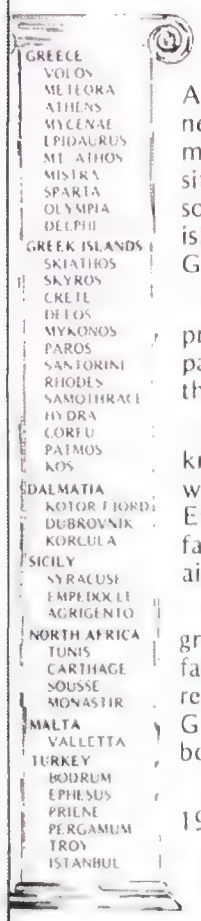

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Smithsonian highlights

Renwick Gallery
"The Designs of Raymond Loewy" is an exhibition of 81 projects designed by Loewy since 1929. The designs are represented by actual objects, models, drawings and photographs. Loewy gained recognition as an industrial designer by applying his talents to automobiles, airplanes, product packaging, boats, the first orbiting space station, vacuum cleaners and dinnerware. Among the objects in the exhibition are a full-sized Avanti automobile and a Lucky Strike cigarette package—opens August 1.

National Portrait Gallery
"The Conflict in Dayton: The Scopes Trial, July 1925" is an exhibition commemorating the 50th anniversary of the trial with photographs, films and memorabilia—through September 16.

The Gallery's second major Bicentennial exhibition, "The Dye Is Now Cast: The Road to American Independence, 1774-1776," is a chronicle of the two crucial years leading to the signing of the Declaration of Independence. The story of the years is interpreted through paintings, sculpture, documents, maps and other items installed in furnished settings of the period—through November 16.

A red, double-decker British bus provides shuttle service between the Gallery and the Museum of History and Technology. The free daily service begins at 10 A.M. at the Portrait Gallery, 9th and F Streets N.W., and 10:30 A.M. at History and Technology on the Mall. The service continues every 60 minutes, with the last shuttle to the Portrait Gallery at 3:30 P.M.

Museum of History and Technology
The continuing exhibit in the newly constructed Hall of Political History is "We The People," a history of American government in three parts: "Of The People" asks who we are and have been in census, symbol and association with the rest of the world; "By The People" demonstrates how we campaign, vote and influence our government; "For The People" portrays the ways our system of government responds to the objectives established in the Constitution. The exhibition is a contemporary restatement of the Smithsonian's political history collection. Four cases of symbols with which the American people have chosen to represent themselves, such as the flag, eagle and Miss Liberty, line the entrance corridor of the exhibition.

Group Tours
To arrange special group tours of exhibitions, Associates should call the following numbers (all in area code 202): National Portrait Gallery 381-6347; Museum of History and Technology 381-5030; Hirshhorn Museum and Sculpture Garden 381-6713; Museum of Natural History 381-6135; National Collection of Fine Arts and Renwick Gallery 381-6541.

Bicentennial Information
Any Associate planning to come to Washington next year should write for advice to the Visitor and Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560.

Smithsonian Commons now open on weekends

As a result of its overwhelming popularity, the Smithsonian Commons is now open on weekends for Associates and their families. Located in the original Castle building, the Commons offers a buffet luncheon entrée for a fixed price of $3.25, with a reduced rate for children. Beverages and desserts are optional. The Reception Center and dining area provide a place for Associates to obtain information and lunch in a relaxed setting while visiting the national museums on the Mall. Hours are 11:15 A.M. to 2:15 P.M. seven days a week. An Associates' card is required.

Freer Gallery of Art

"Art of the Arab World" is a major exhibition of 80 objects, including ceramics, metalwork, glass, crystal and illuminated pages and paintings from Arabic manuscripts. The show surveys Arabic art from the eighth to the 16th Century. A long-handled bronze incense burner adorned with five domes, a 13th-century brass basin inlaid with silver, and a large brass and silver canteen are among the most beautiful and unusual objects in the exhibition—through December.

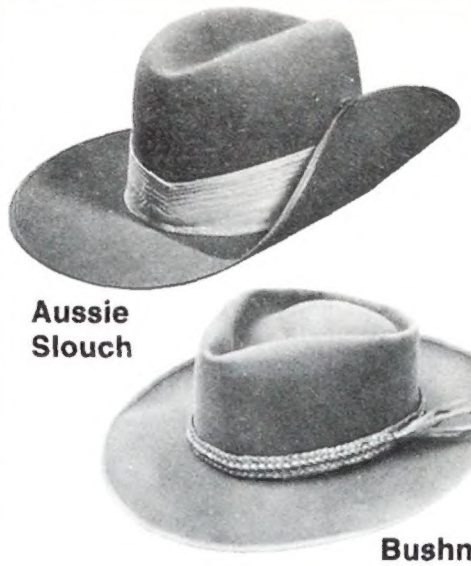
Traveling Exhibition Service

There are up to 70 Smithsonian-sponsored exhibitions on display each month in various parts of the United States. A wide variety of subjects is covered in the shows. For information on bringing an exhibition to your community, write: Smithsonian Institution Traveling Exhibition Service, Washington, D.C. 20560, or call (202) 381-6631.

- Jamestown, New York—"Folk Paintings from Dalarna" (19th-century peasant art from Swedish province of Dalarna), July 26-August 24, James Prendergast Memorial Museum.
- Washington, Texas—"Egyptian Tapestries from the Workshop of Wissa Wassef in Harrania, Egypt" (works by young weavers and students of the late architect Ramses Wissa Wassef), August 9-September 7, The Star of the Republic Museum.
- Raleigh, North Carolina—"Hand of Man on America" (photographs by David Plowden depicting man's impact on natural environments), August 2-31, North Carolina State University Student Center.
- Portland, Oregon—"Graphics by Rolf Nesch" (contemporary Norwegian artist), August 9-September 7, The Portland Museum.
- Tyler, Texas—"Folk Baroque in Mexico" (photographic exhibition of baroque architecture), August 9-September 7, The Tyler Museum of Art.
- Milwaukee, Wisconsin — "American Dolls" (a selection of dolls from the 18th century through the present), August 2-31, Milwaukee Public Museum.

Summer Museum Hours

The Arts and Industries Building, home of the Spirit of St. Louis and the "moon rock," is closed for Bicentennial renovation. Most other museums on the Mall are open daily from 10 A.M. to 9 P.M.



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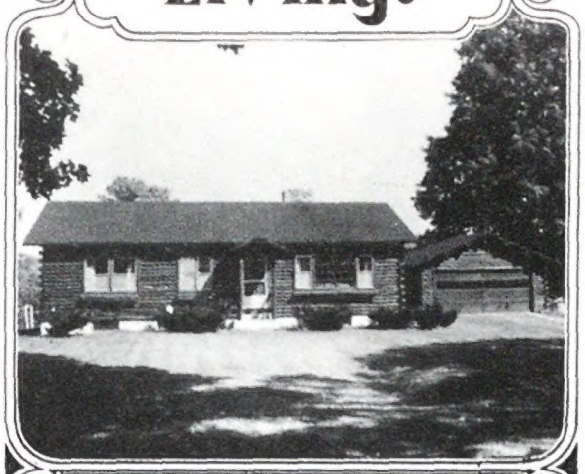

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In this picture Captain Gregory is real enough, but doughnut is said to be fake.

By Richard Pritchett

All right, who did *put the hole in the doughnut?*

An estimated $750 million worth of doughnuts—or donuts, take your choice—are consumed each year in the United States. So popular is the doughnut that the Field Museum of Natural History in Chicago has one in its collection (though not on display) "identified as a glazed donut by the eminent gastroethnologist A. Cruller-Dunquer."

But centuries ago, in England and the Netherlands, when doughnuts had no holes and were known as fried cakes, nobody paid much attention to them. They were soggy in the middle and served mostly to poor relatives. Without its hole, it is doubtful that the doughnut would have achieved its present popularity. So who put the hole in the first doughnut?

His name was Captain Hanson Crockett Gregory, from the rugged American seacoast community of Rockport, Maine. In 1847 (the good captain was only 15) he is supposed to have knocked the soggy center out of a fried cake and come up with the world's first doughnut.

Let there be no doubt that Captain Gregory was the inventor of the hole in the doughnut. This fact was established in what was billed as the Great Doughnut Debate held in New York in late November 1941, just before Pearl Harbor. The heated discussion took place at the Hotel Astor, and was sponsored by the National Dunking Association.

The judges were Clifton Fadiman, Franklin P. Adams and Elsa Maxwell. Speaking in favor of Captain Gregory's claim was Fred E. Crockett of Camden, Maine. In opposition was Henry A. Ellis, a Cape Cod attorney, who claimed the doughnut was invented when a Yarmouth Indian shot an arrow through a fried cake being cooked by a Pilgrim woman over an open fire.

But the issue was never really in doubt. Mr. Ellis, a wily old lawyer, used his best coutroom manners, but his case was a weak one. Mr. Crockett's presentation included an array of affidavits, letters, and other documents. Captain Gregory was the unanimous choice of the judges.

There are many versions of how Captain Gregory happened to discover the doughnut hole. One is that he once lost six men overboard after they had eaten soggy fried cakes. The weight of the cakes made them sink to the bottom like plummets before a rescue could be made. According to this account, the tragedy inspired Gregory to start experimenting. For obvious reasons, the image of a life preserver suggested itself and he invented the first doughnut by punching a hole in a piece of dough with a belaying pin.

In another version, Gregory was nibbling on fried cakes at the wheel of his ship in 1847 when "a sudden squall" blew up. In a desperate attempt to regain control, he rammed the fried cake he was holding on to one of the wheel's spokes. Thus the doughnut was born.

Debater Fred Crockett, who defended Captain Gregory back in 1941, claims that both stories were wrong. "I should know," he said recently. "I'm a direct descendant of the captain."

Crockett said the captain was born in 1832, and was only 15 in 1847, which is too young to be at the wheel of a clipper ship. "The true version isn't spectacular. There were no drowned sailors or sudden squalls. Nothing like that. Young Hanson was in the kitchen of his home watching his mother make fried cakes. He asked her why the centers were so soggy. She said that for some reason they never got cooked. Then the boy decided to poke out the center of some uncooked cakes with a fork. His mother cooked them. They were the first (ring) doughnuts, and I've been told they were quite delicious.

"Hanson's mother must have been delighted with those doughnuts. She made up a batch of them and gave them to neighbors. After that, the owner of a local grocery store started selling them, and the doughnut belonged to the world."

In 1947, a century after the invention of the doughnut, or doughnut hole, whichever you prefer, a bronze tablet was placed on the home where Gregory resided. The inscription on the plaque read: "In commemoration. This is the birthplace of Captain Hanson Gregory who first invented the hole in the doughnut in 1847. Erected by his friends, November 2, 1947."

But what about the Indian who supposedly shot an arrow through the fried cake? It could have happened, too. Several years after the Great Doughnut Debate, the late Henry Ellis, who argued in favor of the Indian, confessed. "It was all a gag," he said. "I've told that story so many times I almost believe it myself."

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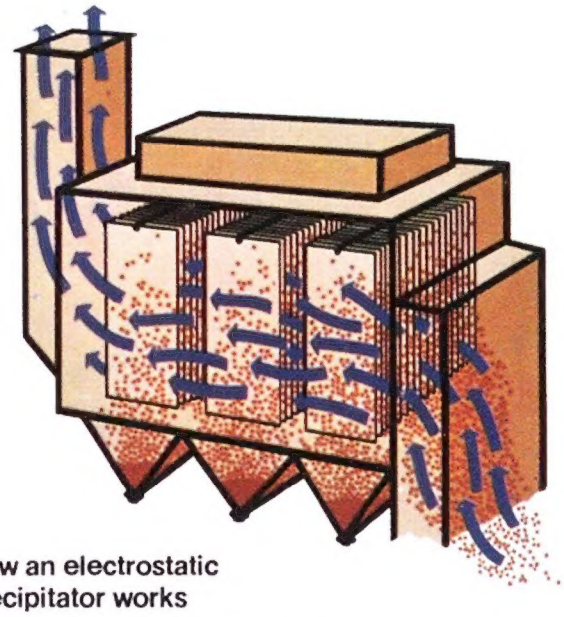

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